X-565-69-56

NASA TM X-63524

THE DATA REDUCTION LABORATORY REFERENCE MANUAL

B. A. WALTON
J. J. QUANN
F. A. KEIPERT

JANUARY 1969

GSFC
GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

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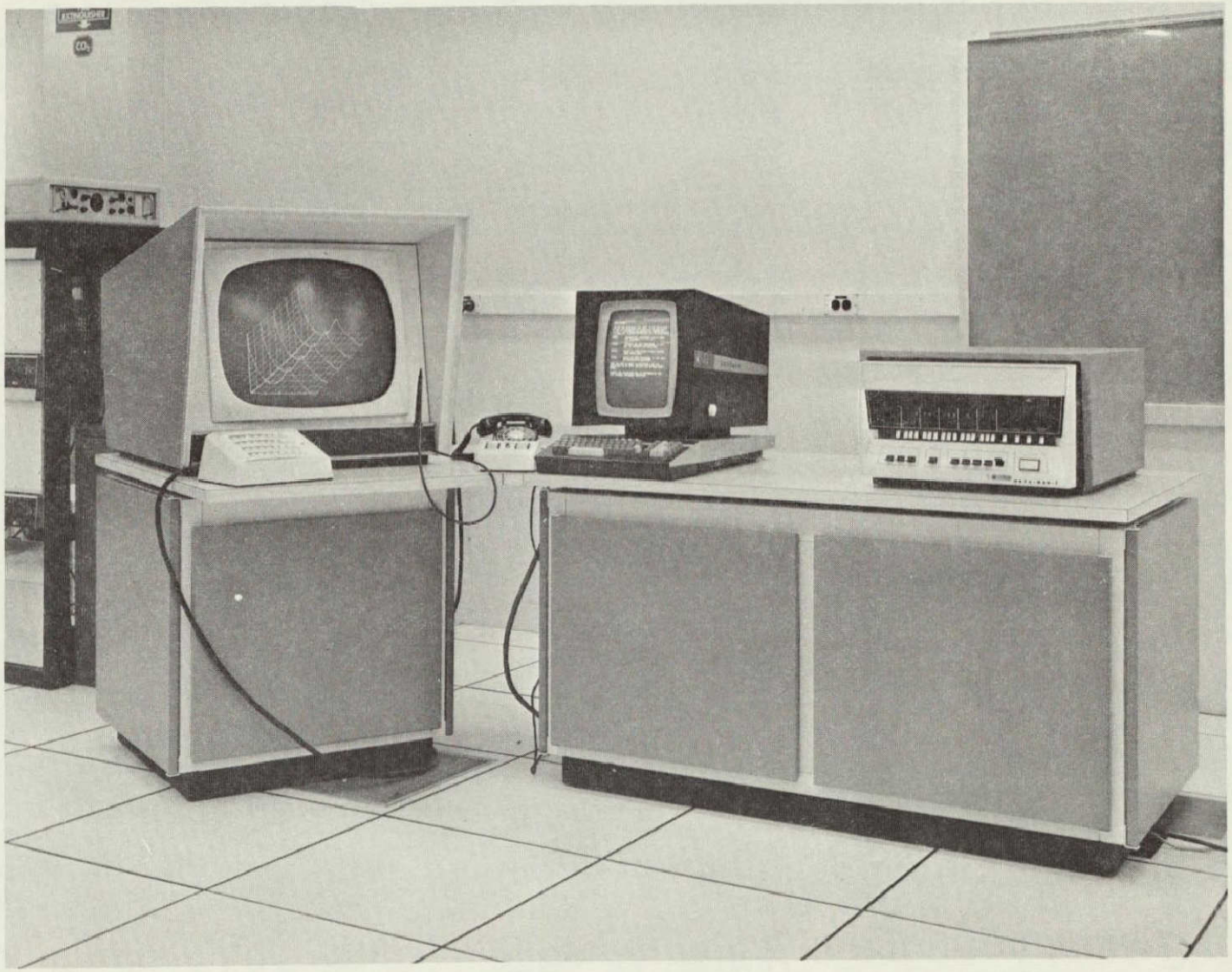
ACKNOWLEDGMENT

The Data Reduction Laboratory is a project within the Information Processing Division and has received continuous support of the Division Chief, Dr George H. Ludwig.

We wish to acknowledge the contributions of all IPD members of this project and the assistance provided by the members of Computer Sciences Corporation who participated in the development of the Data Production Laboratory software.



Data Reduction Laboratory User Terminal

CONTENTS

THE DATA REDUCTION LABORATORY REFERENCE MANUAL

1.0 INTRODUCTION

The Data Reduction Laboratory (DRL) is a workshop for rapid generation, checkout, and modification of processing programs and for the presentation of data processed through these programs.

The DRL is part of the Information Processing Division's computation facility. The Univac 1108 computer system has been augmented with telemetry data input equipment and CRT display devices for this specific function. The system configuration as it presently exists is shown in Figure 1.1. The not so visible but more sophisticated part of the DRL is its software, which operates under the Univac Exec 8 monitor system.

The DRL will accept PCM data in real time or from analog tape, and computer formated data from buffer or edit tapes. The main interface between the users and the DRL is the combination of a communications console (Sanders 720) and a graphic display (IDIIOM). The communications console is used primarily for program generation and modification. The graphic displays are used for on-line data presentation. A hardcopy recorder connected to the graphic displays is available for quick (10 seconds) recording of selected images. In addition to these displays the DRL can provide output over the high speed printer or magnetic tape.

It is the goal of the DRL to provide experimenters with an on-line program generation and data manipulation capability. The prime application of the DRL will be experimenter support during the immediate post launch period and during times of special events.

2.0 GAINING ACCESS

2.1 DRL SYSTEM INITIALIZATION

A file (DRLRUN) containing the EXEC 8 control stream required to begin running DRL resides on Fastrand. This run may be initiated through the teletype connected to the 1108 via the CTMC. The following procedure will be performed only at the start of a DRL session and will normally be done by the person in charge of DRL operations.

2.1.1 Turn on the #1 Sander's 720. Push reset button in control cabinet.

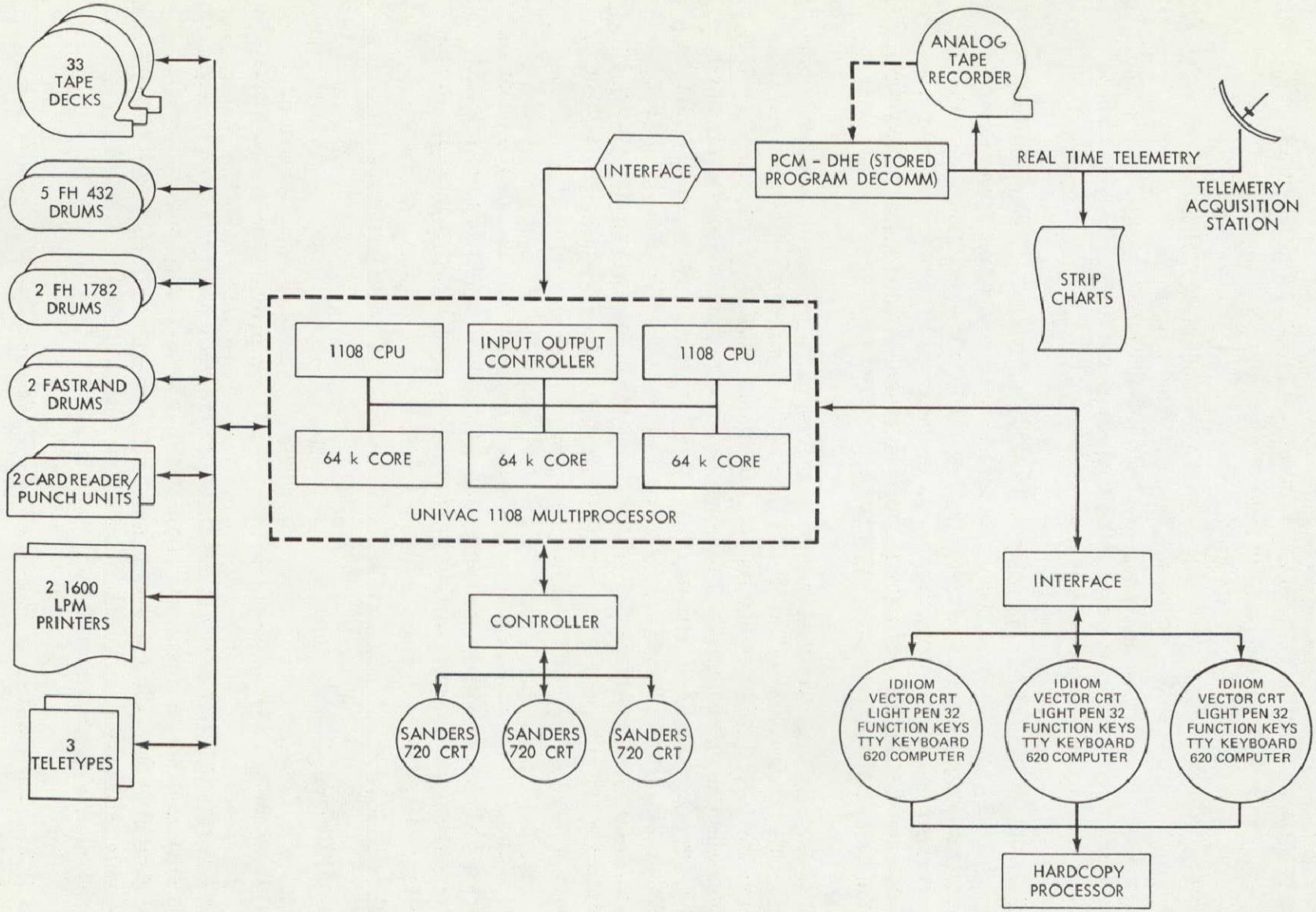

33
TAPE
DECKS
5 FH 432
DRUMS
2 FH 1782
DRUMS
2 FASTRAND
DRUMS
2 CARD READER/
PUNCH UNITS
2 1600
LPM
PRINTERS
3
TELETYPES
ANALOG
TAPE
RECORDER
INTERFACE
PCM - DHE (STORED
PROGRAM DECOMM)
REAL TIME TELEMETRY
TELEMETRY
ACQUISITION
STATION
STRIP
CHARTS
1108 CPU
INPUT OUTPUT
CONTROLLER
1108 CPU
64 k CORE
64 k CORE
64 k CORE
UNIVAC 1108 MULTIPROCESSOR
CONTROLLER
SANDERS
720 CRT
SANDERS
720 CRT
SANDERS
720 CRT
INTERFACE
IDIIOM
VECTOR CRT
LIGHT PEN 32
FUNCTION KEYS
TTY KEYBOARD
620 COMPUTER
IDIIOM
VECTOR CRT
LIGHT PEN 32
FUNCTION KEYS
TTY KEYBOARD
620 COMPUTER
IDIIOM
VECTOR CRT
LIGHT PEN 32
FUNCTION KEYS
TTY KEYBOARD
620 COMPUTER
HARDCOPY
PROCESSOR

Figure 1.1.

2.1.2 At 1108 teletype:

a. set teletype to "LINE"
b. key in: USWAMI
c. system responds: UNIVAC 1108 TIME/SHARING EXEC
d. key in: #RUN IQBAW,I001,DRL
e. system responds DATE TIME
f. key in #START DRLRUN
g. after some delay the first question of the dialog will appear on the #1 Sander's 720
h. key in #FIN

2.2. USER INITIALIZATION

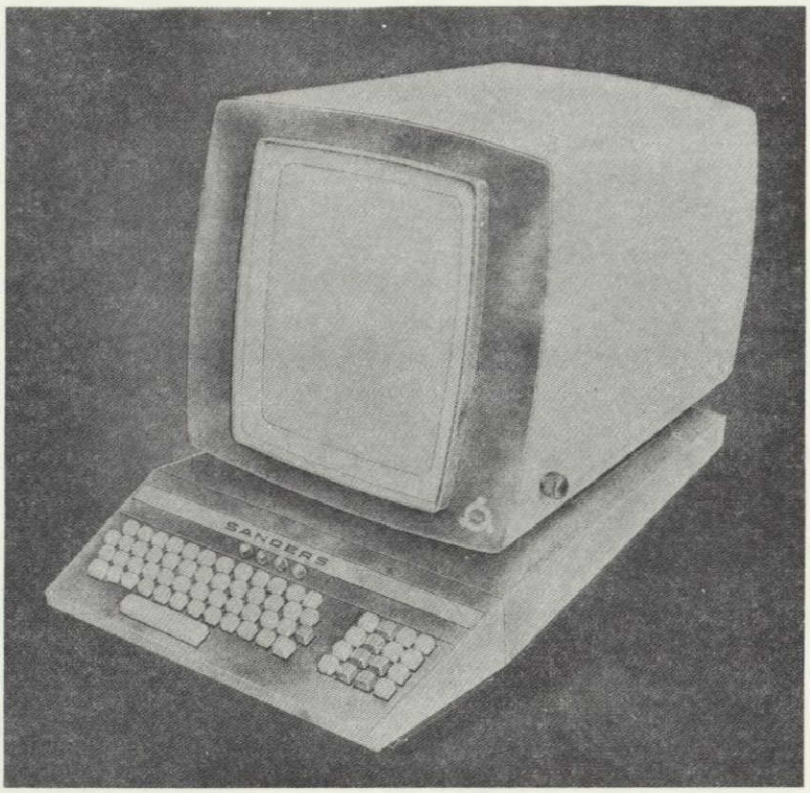
A user terminal consists of an IDIIOM vector display and a Sander's 720 alphanumeric display. User Initialization is performed via the Sander's 720.

2.2.1 Sander's 720 Description

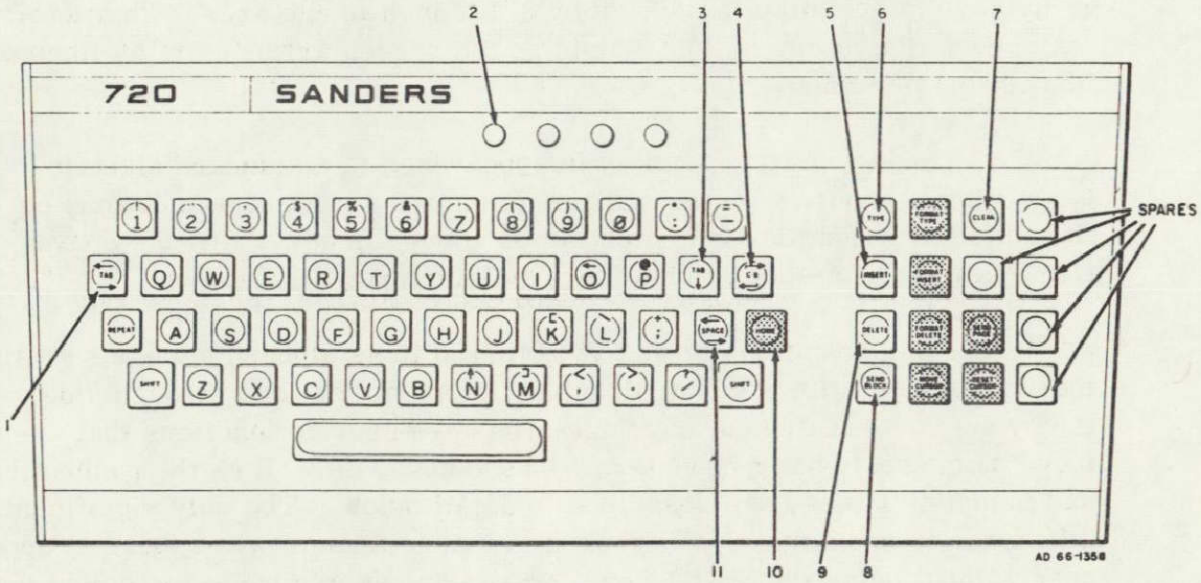
The Display Terminal illustrated on Figure 2.1 resembles a typewriter keyboard attached to a television screen. In addition to the keyboard controls, the Display Terminal contains a POWER ON/OFF switch (located on the brightness control) for energizing the system and a BRIGHTNESS control for adjusting the screen presentation to a comfortable viewing level. It displays information in a 7-1/2 by 9-1/2 inch image area. Characters may be written at any of 2080 points on the screen arranged in 40 lines of 52 position per line.

The keyboard is similar in appearance to a standard electric typewriter keyboard with the addition of an extra bank of pushbuttons on the right side, and four indicator lamps above the keys. All the conventional keys are present, plus a few special carriage-type keys.

The conventional keys are referred to as alphanumeric keys, since they contain all letters of the alphabet, the numbers zero through nine, and the symbols. The special carriage-type keys provide functions that are not found on conventional typewriters. These keys, as well as the pushbuttons and indicator lamps, are described in detail below. The only significant difference in operating this keyboard is that letters always appear in upper case without using the SHIFT key. No provisions are made for typing lower case letters.



Display Terminal



Controls and Indicators

Figure 2.1

When an alphanumeric key or the space bar is struck at the keyboard, the corresponding character or space is immediately displayed on the screen. In addition, a small, blinking line appears at the bottom of the character. This blinking line is referred to as the cursor. It performs the same function as the writing indicator on a conventional typewriter; that is, it indicates where the next typed character will appear on the page.

2.2.2 Sander's 720 Controls and Indicators

Table 2.1 is keyed to the illustration of those Controls and Indicators for the keyboard used in DRL. The conventional alphanumeric typewriter keys are not called out or described, since their functions are considered obvious. Within the character set five symbols (part of the alphanumeric keys) are considered illegal by the DRL system and, therefore, not to be typed in by the user The five illegal 720 symbols are·

Symbol	720 ASCII Octal Code
"	042
. (dot - on same key as 3)	043
@	0100
[	0133
]	0135

When any of the above five 720 symbols are typed in by the user and transmitted to the computer, the DRL system will reject the input and display the 'ILLEGAL CHARACTER IN RESPONSE BLOCK' diagnostic for the user.

2.2.3 Start-up Procedure for Inactive Scope

2.2.3.1 Sander's 720 Turn-on

The red light above the keyboard is lit when the 720 is ON If it is not ON, the white knob on the right side of the CRT is turned clockwise until the light comes on.

Table 2 1

Edit Mode I Operation — Controls and Indicators

Index no.	Control or indicator	Type	Function	Remarks
4	CR	Key	CR moves the Cursor up to the end of the previous line of data CR moves the Cursor down to the beginning of the next line of data	Hold SHIFT key down for CR operation
1	TAB	Key	TAB moves the Cursor to the left. TAB moves the Cursor to the right.	Hold SHIFT key down for TAB operation
11	SPACE	Key	SPACE moves the Cursor to the left to the next alphanumeric SPACE moves the Cursor to the right to the previous alphanumeric	Hold SHIFT key down for SPACE operation
3	TAB ↓	Key	TAB moves the Cursor down to the last alphanumeric at the end of the block of information to be filled in	
10	HOME	Key	HOME moves the Cursor back to the first alphanumeric in the beginning of the block of information to be filled in	

NOTE The SPACE key appears to perform the same function as the space bar in normal typing operations, however, there is a clear distinction between them which is described in the Fundamentals of Operation Remember-they are not the same!

Table 2 1 (Continued)
Edit Mode I Operation — Controls and Indicators

Index no	Control or indicator	Type	Function	Remarks
7	CLEAR	Pushbutton	CLEAR erases the screen of all data and moves the Cursor to the beginning of the block of information to be filled in	
8	SEND BLOCK	Pushbutton	SEND BLOCK sends all the data in the block of information to be filled in to the Data Processor	
6	TYPE	Pushbutton	TYPE allows new alphanumerics to be typed on the screen, old alphanumerics to be erased, or old alphanumerics to be replaced with new ones	Display remains in TYPE mode until another mode (INSERT or DELETE) is selected All Cursor motion keys operate in TYPE mode
5	INSERT	Pushbutton	INSERT allows alphanumerics to be inserted between existing alphanumerics by spreading the text to accommodate the insertion	Display remains in INSERT mode until another mode (TYPE or DELETE) is selected All Cursor motion keys operate in INSERT mode
9	DELETE	Pushbutton	DELETE allows alphanumerics to be deleted by closing up the gap that would normally be left by the deletion	Display remains in DELETE mode until another mode (TYPE or INSERT) is selected Cursor motion controlled by ← SPACE → key only
2	AC ON	Red Indicator	AC ON indicator lamp illuminates when main power is applied to Display Terminal	

2 2 3 2 Clear the scope by hitting the CLEAR button Adjust cursor brightness using the same white knob as above if necessary.

2.2 3.3 Go to active scope Hit HOME and key in:

START SCOPE n

where n = 1, 2 or 3 (see mark on side of scope) Hit SEND BLOCK The first question of the dialog will then appear on scope n

3 0 DIALOG

"Dialog" is the term used for the conversational question-answer mode of user communication from the Sanders 720 alphanumeric scopes to the DRL system Dialog's main function within the system is to allow the user to introduce parametric values to be used in the processing of his data. See Appendix A

3 1 MAJOR CATEGORIES OF DIALOG

Vehicle description: normally supplied by DPE to build a TD (telemetry description) link which is in turn used in the code generation of any process employed for the given vehicle

Pre-execution. supplied by the experimenter, encompasses all pertinent parameters of the current run by tape reels, intervals etc

Display: supplied by the experimenter to define output formating

Diagnostic: presented to the experimenter whenever a processing error occurs on his data and it is expected that a dynamic parameter change may resolve the problem.

System update: used only by DRL systems programmers to enter new, or modify old, dialog, explanations and or system diagnostics into the DRL system.

3.2 DIALOG-RELATED DEFINITIONS

NODE

The basic unit of dialog It consists of the entire screen image to be seen by the user along with executable code to process the user's response, make appropriate data-link entries, and select the next node to be processed

NETWORK

The framework for major sets of logically related dialog nodes A network may contain up to 64 nodes

QUESTION BLOCK

The portion of the output image which is displayed to the user and which he cannot modify

RESPONSE (answer) BLOCK

The portion of the output image initially filled with dashes and into which the user must type his answers

INITIATIVE

The output image of each node contains a twenty-four character lead portion in its response block This area is employed only if the user does not understand the question or wishes to effect a special deviation from the normal node processing The initiative is typed by hitting the HOME key, then typing in one of the DRL defined initiatives (see 3 3) and then hitting SEND BLOCK

3.3 DIALOG INITIATIVES

The defined initiatives of dialog are

CANCEL

The user may wish to discontinue his dialog and may do so by typing the word CANCEL

RENODE

This function allows the user to ask that the current node be redisplayed This feature is used if his typing has currently distorted the screen image

EXPLAIN

This keyin causes an explanation of the current node to be presented on the screen

NARRATE

Allows the user to interrogate the system to see if any alerts concerning the current node have been placed in the system

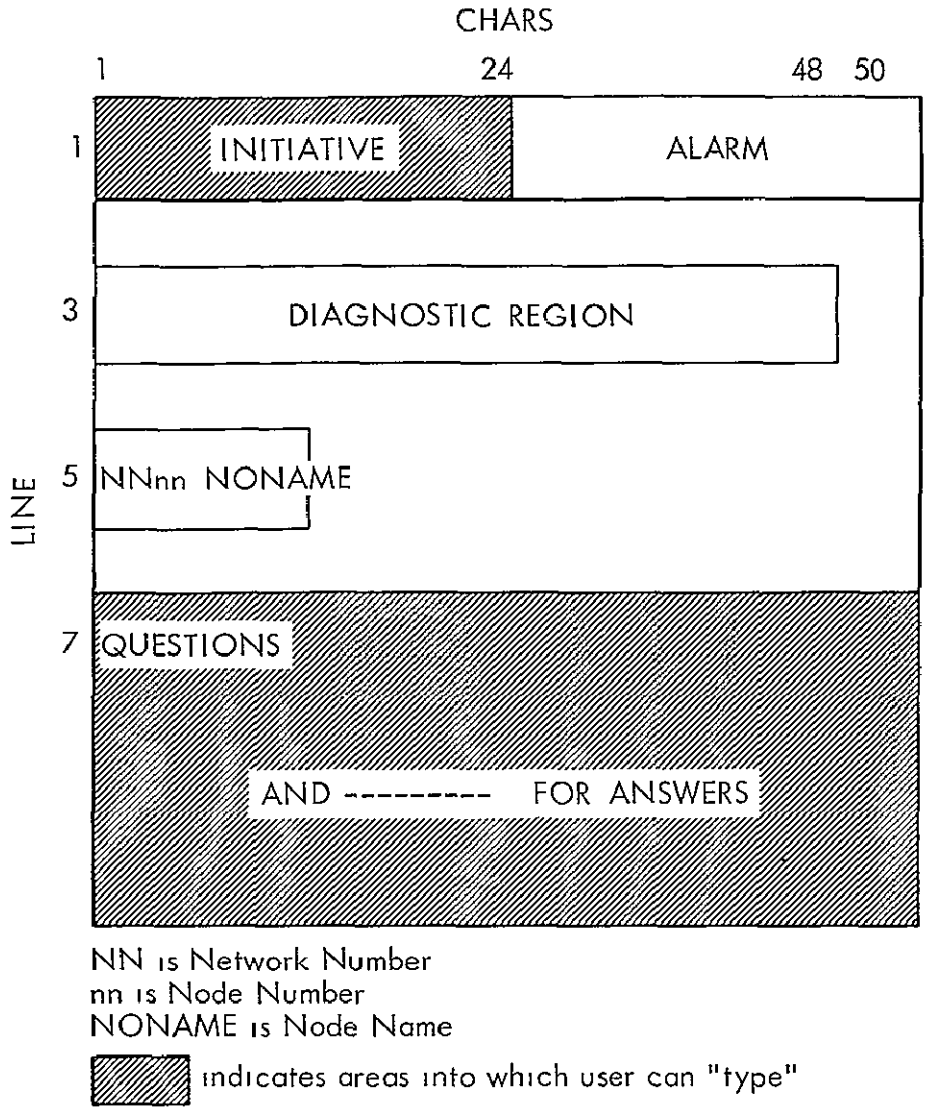


Figure 3 1 Dialog Scope Organization

3 4 SYSTEM LABELS

System Labels provide a standard method to access frequently requested data quantities.

System Labels have a maximum of six characters to represent the complete name (literal) associated with a data quantity The six characters were derived as follows

The first character is a unique letter to identify the source of the data quantity T for tape file-label data, U for user specified input parameters, and I for input frame variables

In most cases, the second through fifth characters are the first two letters extracted from two key words of the complete literal For example, FLNU was extracted from the literal 'FLex format NUmber' If, however, two literals from the same data source produce an identical 5 character label, the last letter of one of the key words is selected to make the labels unique For example, the file-label literals 'STart time of DAta' and 'STop time of DAta' both produce the label TSTDA Therefore, the last letter of the first key word was selected to provide two unique labels TSTTDA and TSTPDA, respectively

System Labels are reserved for the data quantities defined herein If a user duplicates a System Label he will access the system-defined data quantity described herein

A list of current System Labels by source as well as the complete literal associated with each System Label is contained in Appendix B 4

4 0 SYNTAX

A telemetry reduction user-oriented language called GORTRAN (Group Organization Translator) permits the user to give free-form to his data reduction (process) definition The user enters into "syntax mode" from dialog See Appendix A

Since the user's definition may be larger than the CRT face, it has been divided so that he can segment his definition He "types" a part of his definition into the WORK region and hits SEND BLOCK. A part of this will then be displayed in the DISPLAY region to complete a syntax generation/compile cycle He then continues his definition in the WORK region In the case where he has diagnostics, he can enter the ALTER mode (see 4 4) to make corrections

4 1 SCOPE ORGANIZATION

During syntax operations with the Sanders 720 scopes, the CRT's are organized in the following format.

The following sections give a detailed description of each scope region being utilized

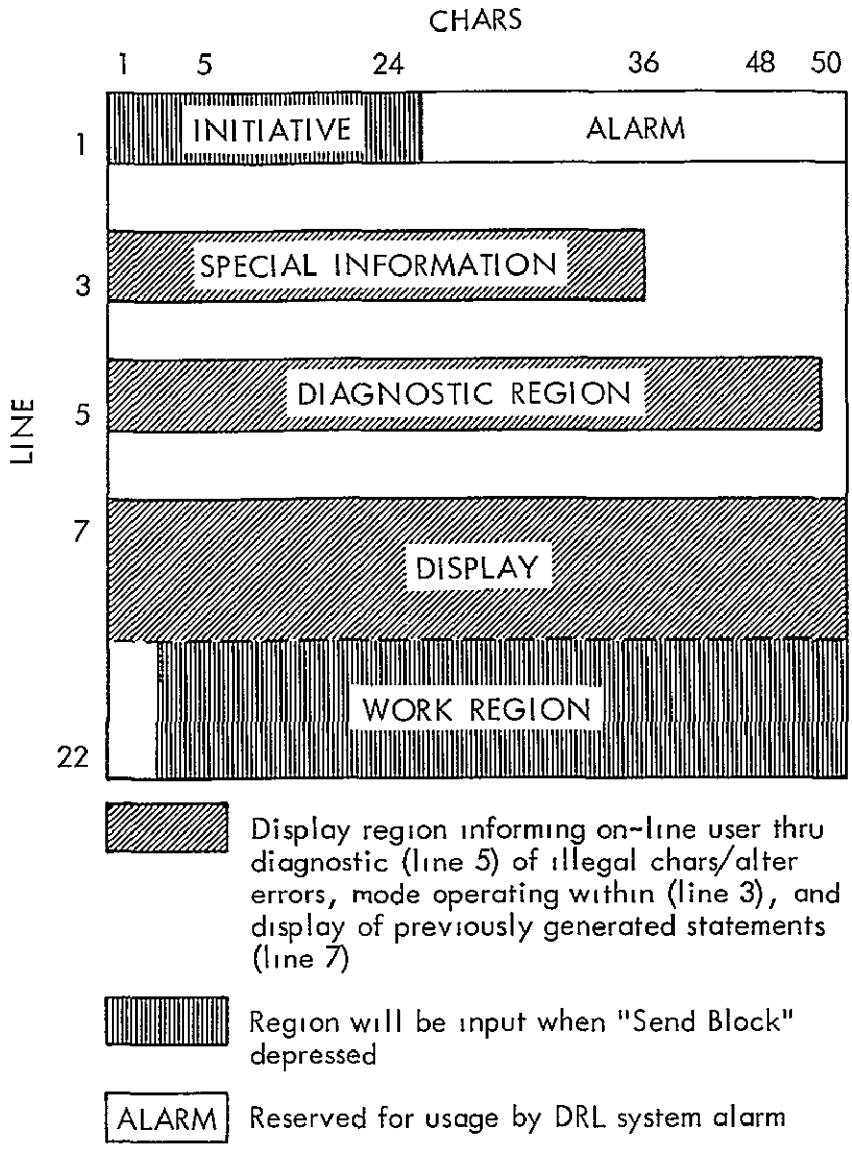


Figure 4.1

4.1 1 Initiative

The INITIATIVE region, 24 characters, is for user initiatives during the course of syntax operations All initiatives can be typed in free field format within the INITIATIVE region The initiatives currently implemented are

A LOOK SIZE N

Sets the number of lines desired to be displayed on the scope for user viewing for each syntax generation/compiler cycle

The maximum number of lines allowed is 15, these lines are shared between DISPLAY/WORK regions The WORK REGION is equal to 15 minus LOOK SIZE requirements An initial LOOK SIZE 0 is provided for the first scope load, this gives a blank page of 15 work lines for initial syntax scope display generation Once the user sets a LOOK SIZE, the initiative is displayed on each scope output and holds until changed A LOOK SIZE 0 indicates that no display of syntax lines is required and 15 line region is used for work block LOOK SIZE 15 indicates that user does not want to generate syntax statements, but view previously generated ones through paging technique

LOOK N

Displays statements beginning with line N

C SUSPEND

Temporarily suspends user and saves all key information up to this point

D TERMINATE

Terminates operations and deletes all key information generated to this point

4 1 2 Diagnostic Region

48 character region for indicating illegal input characters found during syntax interpretation, 'bad' initiatives, alter errors, or bad format return If user responded properly, blank diagnostic is displayed

4.1 3 Special Information

A 36 character region used exclusively, for operating mode information syntax generation, compile, or alter

4 1 4 Display

A 0-15 line region of 50 characters each for viewing previously inserted statements.

SAMPLE FORMAT ASSUME LOOK SIZE 15, ALTER MODE

```
Line   1      4   5                                    50
  1    1          GROUP:ISOTOP:
  2    2          TEST(ERR): 43(1-1) EQ '0'.
  3    3          HOLD(DELE)  42(9-2)·
  4    4          HOLD(EDELE): 43(9-2)·
  5    5*         THEN (ER)::
  6    DIAG             48↑
  7    *          THEN (ERR)::
  8    6          HOLD(D)  44.
  9    7          OUTPUT :
 10               FINJ:·
 11
 12
 13
 14
 15
```

In the above example, characters 1-4 are inserted by DRL on a request for display block The statement numbers are expanded from the left most character In line 7, the asterisk (*) indicates an alter line has been inserted to replace line 5, the 5* on line 5 indicates that this line statement is to be deleted on the final merge In reality, this image reflects the results of several scope operations For instance, the DIAG, line 6, was determined by an incremental compile, alter mode established, and display with diagnostic sent to on-line user for correction The diagnostic code of 48 is an illustration for "no matching tag interpreted " The alter is not assigned a statement number until a compilation is attempted Lines 11-15 indicated no more display lines existing for display.

4 1 5 Work Region

Region of 0 to 15 lines (46 characters, not including format controls) for on-line use of inserting new or alter statements If the user

sends blank work region to be interpreted, it is assumed that paging of display statements is desired and next sequential set of statements within display limits are collected and sent for viewing

4 2 GORTRAN STATEMENT STRUCTURE

The general format of any Gortran statement is·

KEYWORD (LABEL) SPECIFICATION

where: 'KEYWORD' identifies the type of statement, such as TEST, ITEM, PARAM 'LABEL' is the label-field associated with the particular keyword and may have the structure, L1, L2, L3, (multiple entries enclosed by the parentheses) if required by the statement 'SPECIFICATION' is the arithmetic-computation to be performed or logical-test to be evaluated For those keywords/ statements where it is required, the specification is an (operand operator operand) sequence

4 2 1 Operands may be

1. TAGS — Defined by the user (Label) through preceding statements of the Group Definition, or supplied by the system Tags may contain up to 30 alphanumeric characters Examples

   VOLTS = Name supplied by a user

   TIME = Dedicated GORTRAN term used to reference the time (millisecond of year) of the current frame of source input

   TSAID = Term defined for a label element of the input file currently being processed (see 3 4).

2 LITERALS — Constant values enclosed in quotes Examples:

   'AXYZ' = 'HXYZ' = alphanumeric 'XYZ'

   'B101' = Binary 101 = integer 5

   'C101' = 'O101' = Octal '101' = integer 65.

   'D101' = '101' = Decimal 101 = integer 101

   'E15-5' = Exponential 00015

   'F4 1' = '4 1' = Floating 4 1

3 NUMBERS Channel numbers Examples:

:18:	=	Channel 18
:18\3·	=	Channel 18, subcom word 3
:21(11-8):	=	Bits 11-8 of channel 21
:18\10\5·	=	Subsubcom word 5 of subcom 10 of channel 18 (Left handed slash denotes sub-commutation)

4 2.2 Operators may be:

1 Special:
& (ampersand) = concatenation
** (double asterisk) = exponentiation

2 Arithmetic:
+ (plus) = addition
- (minus) = subtraction
* (asterisk) = multiplication
/ (slash) = division

3 List:
, (comma) = list separator
(a) To separate a "word list" of SELECT and ITEM statements
(b) To separate argument list of functions
(c) To separate subscript list of arrays
(d) To separate multiple label entries if required by a statement

4 Relational:

.EQ	=	Equals
NE	=	Not equal
LT	=	Less than
.LE.	=	Less than or equal
GE	=	Greater than or equal
GT	=	Greater than

Boolean:

AND	=	true if both sides true
OR	=	true if either side true

5 Other:

( )	to indicate (a) precedance in arithmetic operations or (b) bit selection in connection with channel numbers
< >	to bracket subscripts

4 2 3 GORTRAN Keywords

GROUP (L1): Always the first statement of a group-definition, where the TAG L1 is a unique TAG for cataloging and access of the group-definition source statements or compiled activity-code

PARAM (L1). 'XX'. Defines the parameter whose name is L1 to have an initial literal value, where 'XX' is one of the literal-types defined at 4 2 1 TAG L1 is available for execution-time type in by the user, where the type-in is made in the alphanumeric-scope initiative-region A new value of 'XX' may be typed in by the initiative:

L1 = 'YY'

The mode (binary, floating, fieldata) of 'YY' must be the same as the mode of 'XX' Param-statements are normally entered immediately after the Group-statement, however, a Param statement may be placed later in the group-definition (following a TEST) to cause program-request of Param type-in

DATA(L1<i1, i2 >) v1, v2
Defines the array whose name is L1 to be resident on a data-link (work area or display-output area), i1, i2,. , if present, define the length of the first-dimension, second dimension, etc , of the array; v1, v2, , if present, define the actual values (literals) which are found in the array A maximum of 2 dimensions is presently allowed Data-statements entered at the top of the group-definition cause the given array to be defined for later use The array is used as the operand of some expression, or may be modified by referencing it in the label of some HOLD statement

Data-statements placed later in the group definition (following a TEST or OUTPUT statement) may be used to reset the values of the array to their original values (omit v1, v2, , since these were entered in the original defining data statement) or to reset them to a new set of values (include a new set of v1, v2,.)

EXAMPLE1· DATA (XYZ<20>) 20 * 0 defines an array called XYZ as 20 values of all zero

EXAMPLE2: HOLD (XYZ<I>): XYZ <I> + '1': increments cell-I of array XYZ by decimal 1.

HOLD(L1)

e1: Causes the arithmetic-expression e1 to be computed, and its value to be stored in the Hold-variable L1 The current value of L1 is available for display whenever an OUTPUT statement is encountered The current value of L1 is available for computational use in other HOLD, ITEM and TEST statements If the Hold-variable is subscripted, its dimension must have been defined by an earlier DATA-statement The arithmetic-expression, e1 can be defined as any grouping of operand operator.operand

ITEM(L1).

e1, e2, Causes each of the arithmetic expressions e1, e2, , to be computed, and their values to be stored sequentially on a burst whose name is L1. An ITEM-burst differs from a Hold-value in that the burst is a time vector of values, oriented to further data reduction or display; whereas the Hold-value is always single-valued with respect to time

If the expression to be computed, e1, contains another item-name as an operand, computation of the expression must be delayed until the operand-item has been collected over the required time interval

TEST (L1) C1

Causes the conditional relation C1 to be evaluated, and following statements to be executed if C1 is true If C1 is false, control skips to a following ELSE (L1) statement, or to a following THEN (L1) statement if no ELSE is present

ELSE (L1)::

Defines the beginning point for statements to be executed if a preceding TEST (L1) has failed

THEN (L1)::

Defines the point where all GORTRAN statements are resumed following a preceding TEST (L1) statement

The conditional relation C1 has the general structure

C1 = (e1 . r e2 . b e3 r e4) b

where e1, e2, e3, e4, are arithmetic expressions, r is a relational operator and b is a boolean operator

Arithmetic expressions for TEST conditional-relations may <u>not</u> contain item-name operands

TRY (L1) C1

Causes the conditional to be evaluated in a time interpolated mode As with TEST, there may be an associated ELSE, and must be an associated THEN for every TRY statement

OUTPUT::

This statement is embedded in the group-definition if frame-oriented output is required Frame oriented output is distinguished from time oriented output

in that the former is triggered by an event that may occur on any frame (frame count exceeds a certain value, a tolerance is exceeded, a subcom sequence is completed, etc) The latter (time oriented output is triggered by a time interval completion event. All HOLD and DATA values are made available to the Frame Oriented Output program

FINI:. Always the last statement of a group-definition, to cause termination of conversational input and completion of compilation

SELECT (L1): n1, n2: Defines the stripping of source-data into a user-required sequence

If it is necessary first to SELECT and align a sequence of user-data (being commutated asynchronously into designated spacecraft maincom/subcom channels), SELECT, SIZE and SYNC are used to accomplish the necessary user-sync.

The sequence of statements required to establish user-sync is

SELECT (Declare the sequence of source maincom/subcom channels required for the user data-sequence)

SIZE (Declare the number of words in each block of user-data)

SYNC (Declare the conditions which establish 'Word 1' of each successive block of user data)

EXAMPLE

```
SELECT (FIELDS)  6,7,8,16,17,18,
                 26,27,28,56,57,58,
                 66,67,68,76,77,78
```

Declares the indicated sequence of main-com channels to be the user data-sequence called FIELDS

ITEM statements following a SELECT statement refer to word-numbers of the resultant block.

EXAMPLE

```
SELECT (FIELDS)  6,7,8,16,17,18,
                 26,27,28,56,57,58,
                 66,67,68,76,77,78

ITEM (X COIL)  1,4,7,10,13,16
ITEM (Y COIL)  2,5,8,11,14,17
ITEM (Z COIL)  3,6,9,12,15,18
```

Declares 'X COIL', 'Y COIL' and 'Z COIL' to be every 3rd word of the burst 'FIELDS', starting with the 1st, 2nd and 3rd word, respectively EG. 'XCOIL' as defined above would actually reference selected channels 6, 16, 26, 56, 66, 76.

SIZE: n:

Defines the length of a block of user-data-words, if the length is other than that implied by the (preceeding) SELECT

Using the SELECT example, above, suppose 5 user-data-values (XCOIL, YCOIL, ZCOIL, GAIN, TEMP) are obtained sequentially from the indicated channels The length of resultant user-data blocks would be defined by

EXAMPLE

```
SIZE (FIELDS)  5
        or
SIZE  5
```

Declares the data-burst 'FIELDS' to be blocked in blocks of 5-words (The label may be omitted if 'SIZE' immediately follows it's 'SELECT')

SYNC C1

Defines conditions for identifying 'WORD 1' (or starting point) of a user-data block Again using the example above, the rules for aligning the 5-word blocks are supplied by a 'SYNC'

EXAMPLE:

```
SELECT (FIELDS) : 6,7,8,16,17,18,
                  26,27,28,56,57,58,66,
                  67,68,76,77,78 ·
SIZE  5 .
SYNC· 4  LT  '64'  AND  5 .GT
      '127'
ITEM (YCOIL) 1:
ITEM (YCOIL) 2
ITEM (ZCOIL) 3·
ITEM (GAIN) :4:
ITEM (TEMP) ·5·
```

Declares the indicated block of 5 values to be 'IN SYNC' when the 4th-word (GAIN) is less than 64 and the 5th-word (TEMP) is greater than 127

Other GORTRAN Keywords

The above keywords may be thought of as the major "working tools" of GORTRAN However, many other telemetry reduction functions (both of convenience and necessity) are implemented by means of the following "extended set" of GORTRAN Keywords

FUNCTION:	define a user function (as opposed to a cataloged function)
JUMP:	to an ENTRY point lower in the group definition
ENTRY·	from an earlier JUMP statement
START:	the beginning of a loop
CYCLE·	from the beginning of a (START) loop

4 3 SYNTAX EXAMPLES

4 3 1 OGO Spacecraft (Notes)

Spacecraft has 128 channels - 9 Bits each
Channels 97, 98 and 99 are subcommutators of 128 channels each
Channels 33, 34 and 35 are the spacecraft clock
Channels 65, 66 and 67 are spacecraft status words
Channels 1, 2 and 3 are spacecraft sync words

4 3 1 1 Isotopic Abundance/Galactic Cosmic Ray

This experiment occupies channels 42, 43 and 44 of the main commutator Each word is 9 Bits long where Bit 1 is the least significant

Channel 42: Bits 9 thru 2 = DELTA E SCINTIL.
Bit 1 = GAIN
Channel 43: Bits 9 thru 2 = E-DELTA E SCINTIL
Bit 1 = ERROR
Channel 44: Bits 9 thru 5 = M
Bits 4 thru 1 = N

When ERROR=1 data from Channels 42 and 43 is to be ignored When GAIN=1 the data in Channels 42 and 43 is to be multiplied by 8 Channel 44 is used to compute D as follows:

$$D = (M+32)\ 2^{**}N - 32$$

where ** denotes exponent

SOLUTION:

```
GROUP  :ISOTOP :
TEST   (ERR)   : 43(1-1) EQ '0':
HOLD   (DELE)  : (42(1-1)*'7'+'1')*42(9-2) :
HOLD   (EDELE): (42(1-1)*'7'+'1')*43(9-2) :
THEN   (ERR)   ::
HOLD   (D)     : (44(9-5)+'32')*'2'**44(4-1)-'32' :
OUTPUT::
FINI   ..
```

4 3 1 2 Charged Particle Experiment

The experiment occupies channels 9, 12, 41, 44, 73, 76, 105 and 108 of the main commutator Each word is 9 Bits long where Bit 1 is the least significant The data alternates every readout—cycling between a voltage output and a current output.

Voltage Output: Bit 9 = 1
Bits 8 thru 3 = VOLTAGE
Bits 2 thru 1 = MODE

MODE=0 or 1 is ELECTRON
MODE=2 or 3 is ION

Current Output: Bit 9 = 0
Bits 8 thru 5 = CURRENT
Bits 4 thru 2 = RANGE
Bit 1 = POLARITY
(0=+, 1=-)

CURRENT is multiplied by 10 to the RANGE

SOLUTION 1

```
GROUP CHARGED PART
SELECT· 9,12,41,44,73,76,105,108
SIZE 2
SYNC 1(9-9) & 2(9-9). EQ. 'B10'  ,TO GET PAIR OF VALUES ,
ITEM(VOLT) 1(8-3)
ITEM(MODE) 1(2-1)
HOLD(CR)  2(8-5)*'10'**2(4-2) :
TEST(T1) 2(1-1).EQ.'B1'  , TEST FOR SIGN ,
HOLD(CR) -CR:
ELSE(T1)
ITEM(CUR). CR
THEN(T1)
FINI
```

SOLUTION 2: (RECOMMENDED SOLUTION)

```
GROUP:CHARGED PART:
SELECT:9,12,41,44,73,76,105,108 :
SIZE·2:   , FORCES SYNC CHECK FOR EVERY PAIR ,
SYNC:1(9-9)&2(9-9) EQ 'B10'·
ITEM(VOLT):1(8-3) :
ITEM(MODE):1(2-1) :
ITEM(CUR):('1'-'2'*2(1-1))*2(8-5)*'10'**2(4-2) :
FINI:.
```

4 4 ALTER MODE PROCESSING

The alter mode is the mode in which a user can change his syntax previously entered into the system

4 4 1 Alter Processing Initiation

As syntax statements are received from the scopes, they undergo an incremental compile for each set If diagnostics occur as a result of the last set processed, the alter mode is automatically started A display is created on the 720 CRT showing the error statement and diagnostic along with the indication that alter processing has been initiated In addition, the user may key-in at any time during compile mode processing an alter initiative which will also cause the alter processing to begin

Once in the alter mode processing, it is impossible to determine if the error has been corrected by any given set of alter changes. Therefore, the on-line user must provide the directive to re-compile and continue in compile mode, if possible

4.4 2 Alter Directives

The alter directive begins with the percent (%) character and must start with the first character of a line Alters and syntax statements can be located with the same physical line provided that they are separated by at least one blank character The directives must be packed without intervening blanks The following directives are being used

1 % A, B
Delete line numbers A thru B Any number of line statements may be inserted after the deleted B.

2 % A
Following line number A, insert any number of line statements

3 %%
Terminate any of the above directives and allow any following line statements to be placed at the sequential end of the program Any statements inserted after the %% are not immediately compiled, processing continues in the alter mode This technique allows the user to complete insertion of the rest of the program, examine it through CRT display, and perform one final compile operation.

4 %%%
A user request that the program be re-compiled from start This is an indication that all errors have been corrected and/ or alter operations have been completed

NOTE· Alters do not have to be sequential, they can be performed in random order Alters to previously altered statements are overriding.

EXAMPLE 1.

Scope Load 1 Assume LOOK SIZE 0

```
Work Area Line   1  GROUP : ISOTOP :
                 2  TEST(ERR):43(1-1) EQ '0' ·
                 3  HOLD(DELE):42(9-2) :
                 4  HOLD(EDELE)·43(9-2) ·
                 5  THEN(ER).:
                 6  HOLD(D):44 ·
                 7  OUTPUT::
                 8  FINI::
```

Scope Load 2: Assume LOOK SIZE 10

```
Display Area Line 1   1    GROUP : ISOTOP :
                  2   2    TEST(ERR) 43(1-1) EQ '0' :
                  3   3    HOLD(DELE):42(9-2) ·
                  4   4    HOLD(EDELE):43(9-2)
                  5   5*   THEN(ER):1
                  6   DIAG      48 ↑
                  7   6    HOLD (D):44 ·
                  8   7    OUTPUT:.
                  9   8    FINI ·
                 10

Work Area Line 1   % 5, 5
                2  THEN(ERR)::
                3  %%%
                4
                5
```

NOTE: During alter processing, the last alter initiative determines the display region

EXAMPLE 2:

Scope Load 1: Assume WORK SIZE 5

Work Area Line 1	% 1, 1	Deletion with insertion
2	ALTER STATEMENT	
3	% 3, 3	Deletion only
4	% 2	Insertion only with directive carrying to next scope load
5	ALTER STATEMENT	Note the random altering to statements 3 and 2

Scope Load 2: Assume WORK SIZE 5

Work Area Line 1	ALTER STATEMENT	Continuation of insertion for % 2 of Scope load 1
2	ALTER STATEMENT	
3	%10, 10 ALTER STATEMENT	Deletion with insertion and alter/statement on same line
4	% 8, 8 ALTER STATEMENT	Deletion with insertion
5	ALTER STATEMENT	

Scope Load 3: Assume WORK SIZE 5

Work Area Line 1	% 4, 4	Deletion only Example of random altering
2	% 1, 1	Example of overriding alter Previous %1, 1 with inserting deletes.
3	%%	
4	NEW STATEMENT	Place at sequential end of program.
5	%%%	Merge alter and recompile

4 4 3 Alter Directive Error Checking

The following rules are used in error checking alter directives·

A For the % A, B, and % A

1 A and B must indicate statements within program limits
2 A < B
3 No blank characters between %, A, and B
4 Limit A and B to a maximum of three numeric characters
5 The last character of an alter directive must be followed by at least one blank character for alter/line statement mixing If there is at least one non-blank character, thereafter, it counts as a statement
6 Any non-directive and non-blank lines following will count as statements for the last control change

B. %%

1. %% must be followed by at least one blank for statement/alter directive mixing
2 Any non-directive and non-blank lines following will count as statements to be placed at end of the program
3 Directive must be packed

C. %%%

1 %%% must be followed by all blank characters within rest of line statement
2 Any lines inserted following the %%% directive line will be marked as alter error lines
3. Directive must be packed

5 0 EXECUTION

5 1 IDIIOM DESCRIPTION

Information Displays, Incorporated, Input-Output Machine, the IDIIOM . is a fully buffered graphic CRT Console (Figure 5 1) IDIIOM includes modules for character writing, line drawing and circle generation Four character sizes, four intensity levels, graphic element flashing, character rotation, and programmable line structure are hardware features of the IDIIOM User-input devices are

provided...light pen, alphanumeric keyboard, and function keys. Output is on 21" rectangular CRT. The IDIIOM is fully buffered with a programmable, 4096 x 16 bit, random access memory.

The IDIIOM is used primarily as an output device under control of its function keys. A special key will be used to activate the hardcopy recorder which will produce a dry, 8-1/2" x 11" reproduction of the image contained on the IDIIOM CRT face at the time this key was pressed.

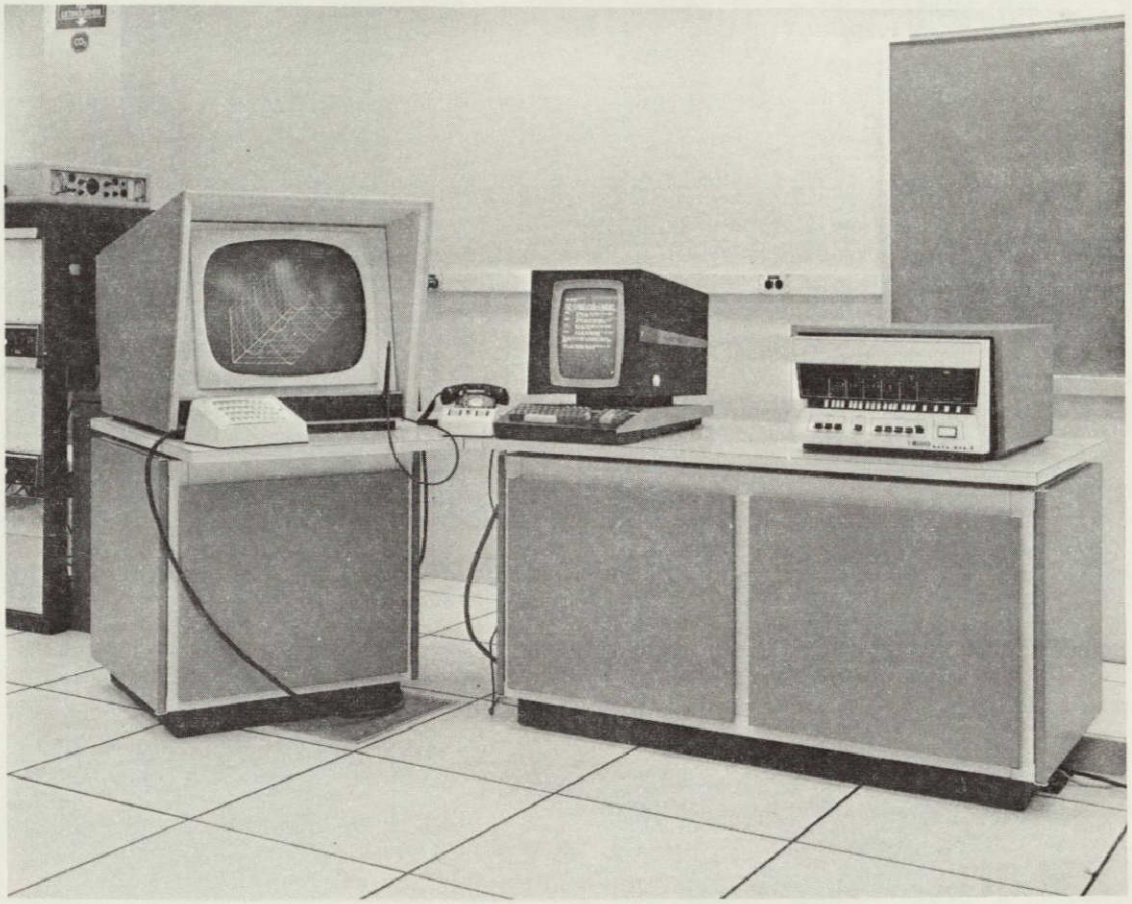


Figure 5.1

5.2 CONSOLE ACTIVITY (SANDERS 720)

During execution, two types of console activity can occur:

1. Initiatives (unsolicited input, typed into the scope initiative area). If dialog is not in progress when the user types in an initiative, response

to the initiative will be delayed until the execution time activity-thread returns for this check once per time-interval. Execution time initiatives allowed for SIMU (Single-Input/Multi-User) are:

SUSPND = Suspend overall execution with input stopped at current point. All user outputs (to the nearest whole page) are forwarded for hardcopy printing. This is the "gone to lunch" feature for SIMU, and processing may be resumed later.

TRMALL = Terminate all processing, deleting all execution code/data links. Output print files may be discarded or printed, under dialog control.

TRMONE = Terminate one user processing. Is followed by a dialog list of current users, from which the on-line user can select the user routine(s) to be terminated. Output print files may be discarded or printed, under dialog control.

PRINOW = Print output file now. Is followed by a dialog list of current off-line print files (print tapes), from which the on-line user can select a tape to be swapped, demounted and printed. With this feature, certain off-line print tapes may be allowed to buildup while other tapes are removed and printed for every few pages that are output.

2. Program initiated dialog is the second kind of console activity that can occur. This type of dialog will occur because of input conditions, user-routine conditions, or output conditions.

   a. Input conditions: TAPE READ ERROR is the major condition, to which the on-line user may respond:

      1. Try again
      2. Skip to next record
      3. Skip to next file (if multi-file reel)
      4. Skip to next reel (if multi-reel input)
      5. Terminate processing (this response is same as TRMALL initiative)

   b. User-routine conditions: PARAMETER CHANGE is the major condition, to which the on-line user responds by typing in the appropriate value of the parameter, or taking other initiative action.

   c. Output conditions: NO OUTPUT TAPE AVAILABLE is the major condition, which occurs because the grouping of user routines is too large, or available tapes have been allocated for other DRL

purposes. The on-line user responds by repeating earlier dialog with fewer user routines gathered into the process, assigning several users to the same print-file tape (in which case, the tape is printed once for each user—the tape print-record format permits multi-users to be merged on the same print tape, and then separated during printing) by repeating earlier dialog, arranging for more tapes to be made available to DRL, or terminating

5 3 POST-EXECUTION

Is entered either because the last reel of input has been processed, or because the TRMALL initiative has been issued Options at this point are.

1 Begin the same process again with new reel number(s), or
2 Sign off, making the on-line scope available for some other user

5 4 SINGLE-INPUT/MULTI-USER ACTIVITY

For launch-support requirements, DRL provides an activity-mode in which telemetry data reduction is performed for a large number of users processing synchronously through one Sanders 720 This activity-mode provides on-line control capabilities to the individual user, under the assumption that during launch the individual user will not enter into extensive on-line execution-time dialog and "slow down" all the other users

To minimize processing delay-time, all user code is combined under a single "Group Collection Routine" and all output-print-files are synchronously produced All user-code is combined into a single instruction-thread, so that each user routine must operate on a per frame basis; and no attempt is made to form sync-pools (SELECT/SIZE/SYNC statements) or data bursts (ITEM statements) In the multi-user launch-support activity-mode defined below, Gortran HOLD-statements are used to compute the contents of data arrays defined by Gortran-DATA-statements These data arrays are routed to the print file on a frame-by-frame basis by the OUTPUT-statement Format of the print-file output is established by display dialog for each individual user; and execution of the data-formatting function is accomplished by the Frame Oriented Output routine

5.4 1 Use of Scopes

The three user Sanders 720 scopes may all be used simultaneously for independent DRL operations Each scope will support a single definition process or execution process involving multiple users

5 4 2 Definition Process

A Definition Process is the operation involved in specifying a DRL data reduction problem It may include a GORTRAN compilation and output set definitions by dialog The results may be stored away for subsequent use

5 4 3 Execution Process

This consists of a multi-user execution, each routine of which was previously defined during a Definition Process Several user's data-reduction routines which use the same input source may be supported concurrently by a single scope The Process begins by identifying input data, and identifying which user routines are to be executed

5 4 4 Cataloging of Processes

To facilitate the multiple execution of a process without the necessity of redefining it each time, the process may be named and stored away

When an Execution Process is to be performed, the names of all the defined processes will be displayed on the face of the appropriate scope The user will be able to select the subset desired in the particular execution

6 0 PRINTER OUTPUT

6 1 OBJECTIVE

A study of typical experimentor requirements indicates the need for a printer output facility capable of handling non-continuous displays which vary from printer page to printer page, printer line to printer line, and fields within a printer line Virtually every field of a printer page may be associated with conditional output requirements Most of the conditional requirements relate to a telemetry or user frame

The objective of the following functional capabilities is to provide a facility to meet the above requirements in a practical and feasible manner

6 2 DEFINITIONS

This section defines various terms used in this functional description

6 2 1 Frame-Oriented Display

Frame-oriented display is that which is normally non-continuous The non-continuous state is attributable to the fact that the particular procedures and output format may vary from frame to frame, or over groups of frames, depending on various data conditions Another mode of display being developed in DRL is called "burst normal " In that mode orientation is around channels of telemetry which are processed as a continuous stream of input (and output) over the designated intervals

6 2 2 Element

There are two types of elements LITERAL ELEMENTS are constant values specified by the user DATA ELEMENTS are the contents of labeled data fields which are defined in one of four ways·

1 GORTRAN DATA statement, may be subscripted
2 GORTRAN HOLD statement.
3 GORTRAN PARAM statement
4 Dialog which names tape label fields

An element is the smallest unit of output information which may be specified It is a component of a LINE or a HEADER LINE

6 2 3 Line

A collection of ELEMENTS which make up a single print line, and any associated HEADER LINES

6 2 4 Block

A collection of LINES which are to be printed as a unit, and any associated HEADER LINES

6 2 5 Logical Page

A predefined arrangement of BLOCKS and LINES to be printed as a unit, and any associated HEADER LINES A LOGICAL PAGE will begin at the top of a physical page, and advance to a new physical page after completion It may take multiple pages

6 2 6 Image

A generic term used to reference a single output subset consisting of one or more ELEMENTS, a single LINE, a single BLOCK or a single LOGICAL PAGE An IMAGE is collected and provided to the output program as a complete subset of data to be output as a unit

6 2 7 Output Set

A selection of IMAGES which may appear interspersed in one contiguous output listing Multiple OUTPUT SETS may be associated with a particular DRL process

6 2 8 Header Line

A line of LITERAL and DATA ELEMENTS associated with a particular LINE, BLOCK, LOGICAL PAGE, or OUTPUT SET which will be output automatically in accordance with certain user-selected options

6 2 9 Condition

The presence or absence of a particular value or set of values in a specified data element. A stated CONDITION may be associated with each defined OUTPUT SET and each IMAGE within the OUTPUT SETS

6.2 10 Display Specification

A generic term to reference all specifications related to displaying an IMAGE or OUTPUT SET DISPLAY SPECIFICATION includes all the information required for line and column positioning control as well as the conditional criteria

6 3 SPECIFIC OUTPUT CAPABILITIES

The capabilities stated in this section are designed to provide a highly versatile frame-oriented (non-continuous) printer output facility

For any given DRL process, a number of OUTPUT SETS may be specified, each independent of the others and each resulting in a separate output listing Each OUTPUT SET is defined by defining all the IMAGES which it may contain and associated HEADER LINES. IMAGES are defined in any order and may appear in the output in any order

The output program is executed as the result of an OUTPUT statement in GORTRAN syntax During execution, each CONDITION associated with an OUTPUT SET is tested. If a CONDITION is present at the OUTPUT SET level, then the CONDITION specified for each defined IMAGE within that OUTPUT SET is also tested Output is generated for those IMAGES whose CONDITION is present If no CONDITION is specified, it is always considered to be present.

6 3 1 Header Lines

For each OUTPUT SET, LOGICAL PAGE, BLOCK or LINE defined, one or more HEADER LINES may also be defined Each HEADER LINE definition consists of specifying the ELEMENTS which comprise it, including their conversion and positioning data

Each individual HEADER LINE will be considered for output each time its associated OUTPUT SET or IMAGE is output, depending upon the output option selected Five options are provided

1 Output one time only, the first time the IMAGE or OUTPUT SET is output.
2 Output each time the associated IMAGE is output (This option is equivalent to Option 1 for an OUTPUT SET)
3 Output at the top of each physical page.
4 Output each time the associated IMAGE is output following a different IMAGE (Not applicable to an OUTPUT SET)
5 Output at the top of each physical page and each time the associated IMAGE is output following a different IMAGE (Not applicable to an OUTPUT SET.)

The various HEADER LINES associated with a particular OUTPUT SET will be considered individually in the same order as they are defined Each may have options for spacing both before and after printing the line

6 3.2 Spacing Options

At various levels, form spacing options are provided In each instance the user will be able to space to top of page (if not there already), or space 1 to 5 lines (unless now at top of page)

6 3.3 Condition Specification

A CONDITION may be specified for each OUTPUT SET and each IMAGE A single named data source and a set of values must be specified Any data source valid as a DATA ELEMENT is also eligible for use in CONDITION specification Values provided for testing may be decimal or octal integers, decimal floating point, or alphanumeric Tests may be for equal, not equal, less, or greater Equal and not equal tests may include a value range or series of values

The following examples illustrate valid capabilities, but are not intended to specify a certain syntactical form

CONDITION specification example:

FUDGE EQ 'ABC'	(single alphanumeric value)
RANGE NE 1 6-8.7	(range of floating point values)
SERIES EQ 1,7,9	(series, decimal integers)
THRESH GT 05	(single octal integer value)

6 3.4 Logical Page Specification

A LOGICAL PAGE specification may include CONDITION and HEADER LINE specifications, if applicable, and any number of BLOCK and LINE specifications BLOCKS and LINES are defined in the same manner within a LOGICAL PAGE as provided for IMAGE definitions, including their own HEADER LINES and spacing options Refer to Sections 6 3 5 and 6 3.6. The LOGICAL PAGE is output in the order that its components are specified Spacing to a new physical page is automatic before printing

6 3 5 Block Specification

Spacing options may be specified before and after printing a BLOCK Initial spacing will be performed before the HEADER LINES are considered

The BLOCK specification may include a CONDITION (if the BLOCK is in fact an IMAGE), spacing options, HEADER LINE specifications, and any number of line specifications, where the latter may have additional spacing options and HEADER LINES Refer to Section 6 3 6

6 3 6 Line Specification

Spacing options may be specified before and after printing a LINE Initial spacing will be performed before the HEADER LINES are considered

The LINE specification may include a CONDITION (if the LINE is in fact an IMAGE), spacing options, HEADER LINE specifications, and ELEMENT specifications Refer to Section 6 3.7

6 3 7 Element Specification

One or more ELEMENTS may be defined as comprising an IMAGE. When this occurs, the ELEMENTS are edited and placed in the print buffer, but are not output They may be followed by additional ELEMENT IMAGES if desired which define additional components in the same output line Output will not take place until a subsequent OUTPUT of a LINE, BLOCK or LOGICAL PAGE takes place, at which time the initial spacing options are performed and HEADER LINES are printed Then additional ELEMENTS if any, defined as part of the first LINE are edited into the buffer and it is printed

The beginning and ending print position of each ELEMENT field must be specified

LITERAL ELEMENTS may be specified independently, or the name of a DATA ELEMENT may be designated as a LITERAL ELEMENT

DATA ELEMENTS may be printed out as octal values, decimal values, or alphanumeric. Decimal values may have a decimal point at any designated position within the field Option to print a special character in the event of overflow will be provided If the same LINE is printed two or more times in succession, a DATA ELEMENT whose value has not changed or is = to zero may be suppressed

A LITERAL ELEMENT may be associated with a DATA ELEMENT or the same line for the purpose of suppressing the LITERAL ELEMENT when the DATA ELEMENT is suppressed

6 3.8 Automatic Array Output

An array defined in a GORTRAN 'DATA' statement may be considered a single ELEMENT, and output of the entire array, or selected parts of it, may be printed automatically The following information must be provided by the user during definition of the output set

1 Number of values to be printed per line This number pertains to this particular array only Other values may appear on the same line, and may in fact be interspersed between values of the array under consideration. The number may be 1

2 Space between values. This is the number of print positions between the ending digits of two consecutive values of this array, on each line If only one value is to be printed per line, this information would not apply

3 Increment between array values It is not necessary to print every value in the array. This increment specifies the interval of selecting values to be printed on each line If it is 0, the same value will be repeated

4 Initial value. It is not necessary to begin with the first value in an array This parameter allows the specification of the first value to be printed The increment (Item 3) is then added to obtain the second value

5 Number of lines This gives the maximum number of lines to be printed from this array. If the entire array is to be printed, this number will be computed for the user

6 Number of values to be bypassed per line After determining the first value to be printed for the first line, this number will be added to determine the starting point for the second line, and added again for each subsequent line This number does not need to be the same as number of values per line.

7 Initial line increment This value is multiplied by the number of values to be bypassed per line (Item 6) to give greater flexibility in selection of the point in the array to begin output Item 6 is then added to this point to begin the second line

8 The name of a variable which gives the total current number of values in the array may be specified if desired This current size, if given, will cause printing to be curtailed automatically if the array is not full

NOTE: Items 3, 4, 6 and 7 may be given as a variable name instead of a constant if desired

APPENDIX A
EXAMPLE

A 1 PROBLEM DEFINITION

OGO Spacecraft (Notes)

Spacecraft has 128 Channels - 9 Bits each
Channels 97, 98 and 99 are subcommutators of 128 Channels each
Channels 33, 34 and 35 are the Spacecraft Clock
Channels 65, 66 and 67 are Spacecraft Status Words
Channels 1, 2 and 3 are Spacecraft Sync Words

ISOTOPIC ABUNDANCE/GALACTIC COSMIC RAY EXPERIMENT

This experiment occupies Channels 42, 43 and 44 of the main commutator Each word is 9 Bits long where Bit 1 is the least significant

Channel 42	Bits 9 thru 2	= DELTA E SCINTIL
	Bit 1	= GAIN
Channel 43	Bits 9 thru 2	= E-DELTA E SCINTIL
	Bit 1	= ERROR
Channel 44	Bits 9 thru 5	= M
	Bits 4 thru 1	= N

When ERROR = 1 data from Channels 42 and 43 is to be ignored When GAIN = 1 the data in Channels 42 and 43 is to be multiplied by 8 Channel 44 is used to compute D as follows:

D = (M+32)2**N - 32 Where ** denotes exponent

A 2 DIALOG AND SYNTAX

0101.START DIALOG

FOR LISTING PURPOSES GIVE YOUR NAME B_A_WALTON__

PICK, BY NUMBER, FROM THE FOLLOWING LIST THAT DRL CAPABILITY WHICH YOU WISH TO USE 5

1 UPDATE DIALOG NETWORK (SYSTEM PROGRAMMER ONLY)

2 CHANNEL DUMP FROM OGO EDIT TAPE

3. CREATE A DATA REDUCTION PROCESS

4 MODIFY AN EXISTING DATA REDUCTION PROCESS.

5 ENTER INPUT DIALOG FOR OGO EDIT TAPE.

6. ENTER A NEW VEHICLE DESCRIPTION (DPE ONLY).

7. MODIFY OR DELETE AN OLD VEHICLE DESCRIPTION (DPE ONLY).

8 TERMINATE USE OF THIS PROCESSING STATION.

IF SELECTION 1 WAS MADE GIVE PASSWORD _____

0135 OGO CH DMP 1

FILL-IN ITEMS FOR INPUT PROCESSING DESCRIPTION

EXPERIMENTER ID: COS RAY ISOTOPIC ABUND

SATELLITE ID: 1

EXPERIMENT NUMBER: 6

SATELLITE ID CHOICES:

1 OGOE
2 OGOF

0136 OGO CH DMP 2

UNIQUE RECORDING STATION DATA TO BE PROCESSED? _NO

IF NO, USER DATA WILL BE PROCESSED FOR ANY STATION NO FURTHER RESPONSE REQUIRED

IF YES, KEY-IN NUMERIC RECORDING STATION NUMBER ___

0137 OGO CH DMP 3

SELECT TELEMETRY DATA FORMAT 0

0 = MAIN COMMUTATION

1 = FLEXIBLE FORMAT

IF FLEX FORMAT DESIRED, KEY-IN A VALUE FROM 1 TO 32 FOR INDICATING TYPE ___

0138.OGO CH DMP 4

KEY-IN ONE OF THE FOLLOWING SYMBOLS FOR DATA MODE TO BE PROCESSED: ANY

RT - REALTIME ONLY

DS - DATA STORAGE (PLAYBACK) ONLY

ANY - ANY OF THE ABOVE MODES WILL BE ACCEPTED FOR DATA PROCESSING

0139 OGO CH DMP 5

SELECT REALTIME DATA RATES FOR PROCESSING: A

FOR POGO:

A = PROCESS DATA FOR ANY RATE ENCOUNTERED

0 = 8 KILOBIT (KB)

1 = 16 KB

2 = 64 KB

FOR EOGO:

A = ANY RATE

0 = 1 KB

1 = 8 KB

2 = 64 KB

0140 OGO CH DMP 6

IS PROCESSING OF DATA FOR SPECIFIC EXPERIMENTS REQUIRED? _NO

IF NO, ANY EXPERIMENTER DATA ENCOUNTERED WILL BE PROCESSED
STATUS INDICATOR IN DATA TAPE FILE LABELS INFORM AS TO
WHICH EXPERIMENTS NO FURTHER RESPONSE REQUIRED

IF YES, KEY-IN BLOCK BELOW VALUES OF 1-36 FOR SELECTING A
DESIRED SET OF EXPERIMENTS WHICH MUST BE ON FOR DATA
PROCESSING VALUES REPRESENT BIT POSITIONS (RIGHT TO LEFT)
IN EXPERIMENT STATUS INDICATOR CHECKED FOR ON/OFF
SETTINGS

--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--

0141 OGO CH DMP 7

DO YOU WISH TO SELECT PARTICULAR FRAMES FROM EACH SUBCOM SEQUENCE FOR PROCESSING? _NO

IF NO, ALL 128 FRAMES WITHIN SUBCOM SEQUENCE EXAMINED FOR PROCESSING NO FURTHER RESPONSE REQUIRED

IF YES, ANSWER ITEMS 1, 2, AND 3

1 KEY-IN FRAME SELECTION METHOD _

D = PROCESS FRAMES AT DISCRETE INTERVALS FROM A REFERENCE FRAME

C = PROCESS ONE CONTINUOUS SET OF FRAMES FROM REFERENCE FRAME

2. SELECT REFERENCE FRAME NUMBER(1-128) AT WHICH TO BEGIN PROCESSING: ___

3 FILL-IN PROCESSING INTERVAL DEPENDENT UPON RESPONSE TO ITEM 1: ___

0142 OGO CH DMP 8

SELECT A TIME/DATA PROCESSING SPAN CONTROL FROM THE FOLLOWING 2

1 = PROCESS ALL TAPE REELS WITH NO TIME CONSTRAINTS

2 = PROCESS ALL REELS OVER 1 TIME INTERVAL TO BE SELECTED

3 = SPECIFIC FILES WITH/WITHOUT TIME CONSTRAINTS ARE TO BE SELECTED FROM EACH REEL

NOTE· MAX OF 8 TAPES CAN BE SELECTED

PROVIDE START YEAR OF DATA 66

0143 OGO CH DMP 9

TIME PROCESSING INTERVALS CAN BE FURNISHED EITHER IN GMT GROUND ENCODE TIME OR SPACE CRAFT CLOCK COUNTS

SELECT METHOD DESIRED: GMT

GMT = GMT GROUND ENCODED TIME

SCC = SPACECRAFT CLOCK COUNTS

IF GMT, NO FURTHER FILL-IN REQUIRED

IF SCC, FILL-IN REFERENCE CLOCK COUNT AND CORRESPONDING GMT TIME

CLOCK COUNT (OCTAL): _ _ _ _ _ _ _ _ _

GMT TIME:

YR: _ _ DAY: _ _ _ HR: _ _

MIN: _ _ SEC: _ _

0145 OGO CH DMP 11

KEY-IN GMT TIME SPAN TO BE USED FOR PROCESSING OVER ALL TAPE REELS.

START TIME:

YR: 66 DAY: 182 HR: _1

MIN: _0 SEC: _0

TIME INTERVAL: _86400 SEC

0146 OGO CH DMP 12

KEY-IN A MAXIMUM OF 8 TAPE REEL NUMBERS FOR PROCESSING IN ASCENDING ORDER OF DATA TIME

REEL NUMBER FORMAT: AANNNN

WHERE A = ALPHABETIC (A-Z)

N = NUMERIC (0-9)

AB1234

AB1235

AB1236

0101 START DIALOG

FOR LISTING PURPOSES GIVE YOUR NAME B A WALTON__

PICK, BY NUMBER, FROM THE FOLLOWING LIST THAT DRL CAPABILITY WHICH YOU WISH TO USE 3

1 UPDATE DIALOG NETWORK (SYSTEM PROGRAMMER ONLY)

2 CHANNEL DUMP FROM OGO EDIT TAPE

3 CREATE A DATA REDUCTION PROCESS

4 MODIFY AN EXISTING DATA REDUCTION PROCESS

5 ENTER INPUT DIALOG FOR OGO EDIT TAPE.

6 ENTER A NEW VEHICLE DESCRIPTION (DPE ONLY).

7 MODIFY OR DELETE AN OLD VEHICLE DESCRIPTION (DPE ONLY).

8 TERMINATE USE OF THIS PROCESSING STATION.

IF SELECTION 1 WAS MADE GIVE PASSWORD _____

0201 CONT1

TO DEFINE YOUR PROCESSING ELEMENT USING GORTRAN SYNTAX SEND BLOCK

```
LOOK SIZE 0

SYNTAX: COMPILE MODE


GROUP  :ISOTOP·
TEST   (ERR)    : 43(1-1) EQ '0'
HOLD   ( DELE) : (42(1-1)*'7'+'1')*42(9-2):
HOLD   (EDELE): (42(1-1)*'7'+'1')*43(9-2):
THEN   (ERR)    .:
HOLD   (D)      · (44(9-5)+'32')*'2'**44(4-1)-'32':
OUTPUT::
FINI   ··
```

0202 CONT2 1

THE GORTRAN SYNTAX DEFINITION HAS BEEN COMPLETED SHALL WE GENERATE INSTRUCTION CODE? (SELECT BY NUMBER)

1. YES

2 NO

0230.FOPN00

YOU ARE ABOUT TO BEGIN TO DESCRIBE OUTPUT TO THE PRINTER
LISTED BELOW ARE USEFUL DEFINITIONS

AN OUTPUT SET IS A SELECTION OF IMAGES WHICH MAY APPEAR INTER-
SPERSED IN ONE CONTIGUOUS OUTPUT LISTING MULTIPLE OUTPUT
SETS ARE PERMITTED

IMAGES ARE.

LITERAL ELEMENTS - CONSTANT VALUES SPECIFIED BY THE USER

DATA ELEMENTS - CONTENTS OF VARIABLE DATA FIELDS

LINE - COLLECTION OF ELEMENTS WHICH MAKE UP A SINGLE PRINT
LINE

BLOCK - A COLLECTION OF LINES WHICH ARE TO BE PRINTED AS A UNIT

LOGICAL PAGE - A PREDEFINED ARRANGEMENT OF BLOCKS AND LINES
TO BE PRINTED AS A UNIT

HEADER LINE - A LINE OF ELEMENTS ASSOCIATED WITH A PARTICULAR
LINE, BLOCK, LOGICAL PAGE, OR OUTPUT SET

DEPRESS SEND BLOCK TO ENTER OUTPUT DIALOG

0231 FOPN01

FRAME-ORIENTED LINE PRINTER DISPLAY IS SPECIFIED AS ONE OR MORE OUTPUT SETS TO BE ASSOCIATED WITH A PARTICULAR DRL GORTRAN DEFINED PROCESS EACH OUTPUT SET IS TO BE DEFINED ONE AT A TIME

IF YOU WISH TO REFERENCE THE OUTPUT SET ABOUT TO BE DEFINED THEN GIVE A REFERENCE NAME: ISOTOP

DO YOU WISH TO MAKE THE PRINTOUT OF THE OUTPUT SET ABOUT TO BE DEFINED CONDITIONAL? NO

0232 FOPN02

OUTPUT SET

FOR THE OUTPUT SET OR CURRENT IMAGE STATED ABOVE DO YOU WISH TO SPECIFY ANY ASSOCIATED HEADER LINES? YES_

0234.FOPN04

OUTPUT SET

SPECIFY HEADER LINE INFORMATION FOR THE OUTPUT SET OR CURRENT IMAGE STATED ABOVE

LINE SPACING IS TO BE 0 BEFORE THE HEADER LINE IS PRINTED AND 1 AFTER THE HEADER LINE IS PRINTED. (FIVE SPACES MAXIMUM FOR EACH)

SPECIFY ONE OF THE HEADER LINE PRINT OPTIONS LISTED BELOW: 3

(ONLY 1 AND 3 MAY BE SELECTED FOR OUTPUT SETS)

1 PRINT ONCE ONLY, THE FIRST TIME THE IMAGE OR OUTPUT SET IS OUTPUT

2. EACH TIME THE ASSOCIATED IMAGE IS OUTPUT

3 AT THE TOP OF EACH PHYSICAL PAGE

4 EACH TIME THE ASSOCIATED IMAGE IS OUTPUT FOLLOWING A DIFFERENT IMAGE

5 AT THE TOP OF EACH PHYSICAL PAGE AND EACH TIME THE ASSOCIATED IMAGE IS OUTPUT FOLLOWING A DIFFERENT IMAGE

0237.FOPN07

HEADER/OUTPUT SET

A FOR THE IMAGE STATED ABOVE SPECIFY A CATEGORY FOR ELEMENT DEFINITION: 1

1 LITERAL ONLY

2 DATA ONLY

3 LITERAL ASSOCIATED WITH DATA ON SAME LINE

B IF THE RESPONSE TO A ABOVE IS 2 OR 3

1 STATE THE GORTRAN VARIABLE OR THE WORD PAGE IF DATA IS TO BE PAGE NUMBER:

---

2 IF THE ABOVE VARIABLE IS MILLISEC OF YEAR FORMAT DO YOU WANT THE PRINTOUT TO BE DAY, HR., MIN., ETC ?____

3. DO YOU WISH TO SPECIFY A CONDITION TO SUPPRESS DATA ELEMENT PRINTOUT?___

C IF THE RESPONSE TO A ABOVE IS 1 OR 3 STATE THE LITERAL ELEMENT AS IT IS TO BE SEEN PRINTED OUT.

MONTH DAY HOUR MIN SEC D DELE E

DELE

0240 FOPN10

LITERAL ELEMENT/HEADER/OUTPUT SET

FOR THE ELEMENT ABOVE STATE:

A THE STARTING PRINT POSITION: __1

WHEN STATING LENGTH OF FIELD FOR DATA ELEMENTS INCLUDE SIGN AND DECIMAL POINT FOR EXPONENTIAL OUTPUT INCLUDE 6 CHARACTERS FOR SIGN, DECIMAL POINT AND EXPONENTIAL FACTORS

B THE LENGTH OF THE PRINT FIELD: _60

0241 FOPN11

LITERAL ELEMENT/HEADER/OUTPUT SET

DO YOU WISH TO PRINT THE ABOVE ELEMENT MORE THAN ONCE ON THE LINE? _NO

IF YES THEN COMPLETE THE FOLLOWING.

PRINT THE ELEMENT __ TIMES ON THE LINE WITH __ PRINT SPACES BETWEEN THE STARTING PRINT POSITIONS OF THE REPEATED ELEMENT

0243 FOPN13

HEADER/OUTPUT SET

DO YOU WISH TO SPECIFY ANY MORE ELEMENTS FOR THE ABOVE IMAGE? _NO

0244 FOPN14

OUTPUT SET

DO YOU WISH TO SPECIFY ANY MORE HEADER LINES FOR THE ABOVE IMAGE? NO

0235 FOPN05

OUTPUT SET

THE PRIMARY IMAGES OF AN OUTPUT SET ARE TO BE SELECTED AND DEFINED ONE AT A TIME

SELECT A PRIMARY IMAGE TO DEFINE 3

1 LOGICAL PAGE (COLLECTION OF BLOCKS AND LINES)
2 BLOCK (COLLECTION OF LINES)
3 LINE (COLLECTION OF ELEMENTS)
4 ELEMENT (LITERAL OR DATA OUTPUT WITH NEXT LINE)

A IF YOU WISH TO REFERENCE THE PRIMARY IMAGE ABOUT TO BE DEFINED THEN GIVE A REFERENCE NAME _____

B IS THE PRINTOUT OF THE SELECTED PRIMARY IMAGE TO BE CONDITIONAL? NO

0247 FOPN17

LINE

FOR THE CURRENT IMAGE STATED ABOVE GIVE

1 THE REQUIRED LINE SPACING BEFORE IMAGE PRINTOUT: 1
(MAXIMUM OF 5 LINE SPACES)

2 THE REQUIRED LINE SPACING AFTER IMAGE PRINTOUT: 0
(MAXIMUM OF 5 LINE SPACES)

0232. FOPN02

LINE

FOR THE OUTPUT SET OR CURRENT IMAGE STATED ABOVE DO YOU WISH TO SPECIFY ANY ASSOCIATED HEADER LINES? __NO

0237 FOPN07

LINE

A FOR THE IMAGE STATED ABOVE SPECIFY A CATEGORY FOR ELEMENT DEFINITION: 2

1 LITERAL ONLY
2 DATA ONLY
3 LITERAL ASSOCIATED WITH DATA ON SAME LINE

B IF THE RESPONSE TO A ABOVE IS 2 OR 3

1 STATE THE GORTRAN VARIABLE OR THE WORD PAGE IF DATA IS TO BE PAGE NUMBER:
TIME

2 IF THE ABOVE VARIABLE IS MILLISEC OF YEAR FORMAT DO YOU WANT THE PRINTOUT TO BE DAY, HR , MIN , ETC ? YES

3 DO YOU WISH TO SPECIFY A CONDITION TO SUPPRESS DATA ELEMENT PRINTOUT? NO

C IF THE RESPONSE TO A ABOVE IS 1 OR 3 STATE THE LITERAL ELEMENT AS IT IS TO BE SEEN PRINTED OUT

0248 FOPN18

DATA ELEMENT/LINE

TIME

A PLACE AN X IN THE SPACE PROVIDED TO SELECT THE TIME COMPONENTS TO BE PRINTED TOGETHER ON ONE LINE AS A SINGLE UNIT FOR THE IMAGE STATED ABOVE

		SPACING REQUIRED
X	MONTH OF YEAR	6
X	DAY OF MONTH	7
_	DAY OF YEAR	9
X	HOUR OF DAY	6
X	MINUTE OF HOUR	7
X	SECOND AND FRACTION OF SECONDS	11

B THE LENGTH OF THE PRINT FIELD IS THE SUM OF THE SPACING REQUIRED OF THE SELECTED COMPONENTS HOWEVER, SPECIFY THE STARTING PRINT POSITION FOR THE TIME SET SELECTED· __1

0241 FOPN11

DATA ELEMENT/LINE

TIME

DO YOU WISH TO PRINT THE ABOVE ELEMENT MORE THAN ONCE ON THE LINE? _NO

IF YES THEN COMPLETE THE FOLLOWING:

PRINT THE ELEMENT __ TIMES ON THE LINE WITH __ PRINT SPACES BETWEEN THE STARTING PRINT POSITIONS OF THE REPEATED ELEMENT

0243 FOPN13

LINE

DO YOU WISH TO SPECIFY ANY MORE ELEMENTS FOR THE ABOVE IMAGE? YES

0237 FOPN07

LINE

A FOR THE IMAGE STATED ABOVE SPECIFY A CATEGORY FOR ELEMENT DEFINITION: 2

1 LITERAL ONLY
2 DATA ONLY
3 LITERAL ASSOCIATED WITH DATA ON SAME LINE

B IF THE RESPONSE TO A ABOVE IS 2 OR 3

1 STATE THE GORTRAN VARIABLE OR THE WORD PAGE IF DATA IS TO BE PAGE NUMBER:
D_____

2 IF THE ABOVE VARIABLE IS MILLISEC OF YEAR FORMAT DO YOU WANT THE PRINTOUT TO BE DAY, HR , MIN , ETC ?____

3 DO YOU WISH TO SPECIFY A CONDITION TO SUPPRESS DATA ELEMENT PRINTOUT? _NO

C IF THE RESPONSE TO A ABOVE IS 1 OR 3 STATE THE LITERAL ELEMENT AS IT IS TO BE SEEN PRINTED OUT.

0239 FOPN09

DATA ELEMENT/LINE

D

FOR THE DATA ELEMENT STATED ABOVE SELECT ONE OF THE FOLLOWING MODES OF PRINTOUT: 5

(ALL SIGNED MODES WILL HAVE THE SIGN SUPPRESSED IF POSITIVE)

1 UNSIGNED OCTAL INTEGER WITH LEADING ZERO
2 SIGNED DECIMAL INTEGER
3 SIGNED EXPONENTIAL
4 SIGNED FLOATING POINT
5 UNSIGNED DECIMAL INTEGER

IF THE RESPONSE ABOVE IS 3 OR 4 STATE THE NUMBER OF DIGITS TO THE LEFT OF THE DECIMAL POINT __

0240 FOPN10

DATA ELEMENT/LINE

D

FOR THE ELEMENT ABOVE STATE·

A. THE STARTING PRINT POSITION· _41

WHEN STATING LENGTH OF FIELD FOR DATA ELEMENTS INCLUDE SIGN AND DECIMAL POINT FOR EXPONENTIAL OUTPUT INCLUDE 6 CHARACTERS FOR SIGN, DECIMAL POINT AND EXPONENTIAL FACTORS

B THE LENGTH OF THE PRINT FIELD: __7

0241 FOPN11

DATA ELEMENT/LINE

D

DO YOU WISH TO PRINT THE ABOVE ELEMENT MORE THAN ONCE ON THE LINE? _NO

IF YES THEN COMPLETE THE FOLLOWING:

PRINT THE ELEMENT __ TIMES ON THE LINE WITH __ PRINT SPACES BETWEEN THE STARTING PRINT POSITIONS OF THE REPEATED ELEMENT.

0243. FOPN13

LINE

DO YOU WISH TO SPECIFY ANY MORE ELEMENTS FOR THE ABOVE IMAGE ? YES

0237 FOPN07

LINE

A FOR THE IMAGE STATED ABOVE SPECIFY A CATEGORY FOR ELEMENT DEFINITION· 2

1 LITERAL ONLY
2 DATA ONLY
3 LITERAL ASSOCIATED WITH DATA ON SAME LINE

B IF THE RESPONSE TO A ABOVE IS 2 OR 3

1 STATE THE GORTRAN VARIABLE OR THE WORD PAGE IF DATA IS TO BE PAGE NUMBER
DELE
---

2 IF THE ABOVE VARIABLE IS MILLISEC OF YEAR FORMAT DO YOU WANT THE PRINTOUT TO BE DAY, HR., MIN , ETC ? ____

3 DO YOU WISH TO SPECIFY A CONDITION TO SUPPRESS DATA ELEMENT PRINTOUT? YES

C IF THE RESPONSE TO A ABOVE IS 1 OR 3 STATE THE LITERAL ELEMENT AS IT IS TO BE SEEN PRINTED OUT

0238 FOPN08

DATA ELEMENT/LINE

DELE

SPECIFY THE TYPE OF CONDITIONAL SUPPRESSION DESIRED FOR THE ABOVE DATA ELEMENT: 2

1 EQUAL TO ZERO
2 EQUAL TO PREVIOUS VALUE

0239 FOPN09

DATA ELEMENT LINE

DELE

FOR THE DATA ELEMENT STATED ABOVE SELECT ONE OF THE FOLLOWING MODES OF PRINTOUT· 5

(ALL SIGNED MODES WILL HAVE THE SIGN SUPPRESSED IF POSITIVE)

1. UNSIGNED OCTAL INTEGER WITH LEADING ZERO
2 SIGNED DECIMAL INTEGER
3 SIGNED EXPONENTIAL
4 SIGNED FLOATING POINT
5 UNSIGNED DECIMAL INTEGER

IF THE RESPONSE ABOVE IS 3 OR 4 STATE THE NUMBER OF DIGITS TO THE LEFT OF THE DECIMAL POINT: __

0240 FOPN10

DATA ELEMENT LINE

DELE

FOR THE ELEMENT ABOVE STATE:

A THE STARTING PRINT POSITION: 50

WHEN STATING LENGTH OF FIELD FOR DATA ELEMENTS INCLUDE SIGN AND DECIMAL POINT. FOR EXPONENTIAL OUTPUT INCLUDE 6 CHARACTERS FOR SIGN, DECIMAL POINT AND EXPONENTIAL FACTORS

B THE LENGTH OF THE PRINT FIELD: 4

0241 FOPN11

DATA ELEMENT/LINE

DELE

DO YOU WISH TO PRINT THE ABOVE ELEMENT MORE THAN ONCE ON THE LINE? _NO

IF YES THEN COMPLETE THE FOLLOWING:

PRINT THE ELEMENT __ TIMES ON THE LINE WITH __ PRINT SPACES BETWEEN THE STARTING PRINT POSITIONS OF THE REPEATED ELEMENT

0243 FOPN13

LINE

DO YOU WISH TO SPECIFY ANY MORE ELEMENTS FOR THE ABOVE IMAGE ? YES

0237 FOPN07

LINE

A FOR THE IMAGE STATED ABOVE SPECIFY A CATEGORY FOR ELEMENT DEFINITION· 2

1 LITERAL ONLY
2 DATA ONLY
3 LITERAL ASSOCIATED WITH DATA ON SAME LINE

B IF THE RESPONSE TO A ABOVE IS 2 OR 3

1 STATE THE GORTRAN VARIABLE OR THE WORD PAGE IF DATA IS TO BE PAGE NUMBER.

EDELE

2 IF THE ABOVE VARIABLE IS MILLISEC OF YEAR FORMAT DO YOU WANT THE PRINTOUT TO BE DAY, HR , MIN , ETC ?____

3 DO YOU WISH TO SPECIFY A CONDITION TO SUPPRESS DATA ELEMENT PRINTOUT? YES

C IF THE RESPONSE TO A ABOVE IS 1 OR 3 STATE THE LITERAL ELEMENT AS IT IS TO BE SEEN PRINTED OUT

0238 FOPN08

DATA ELEMENT/LINE

EDELE

SPECIFY THE TYPE OF CONDITIONAL SUPPRESSION DESIRED FOR THE ABOVE DATA ELEMENT. 2

1. EQUAL TO ZERO
2. EQUAL TO PREVIOUS VALUE

0239 FOPN09

DATA ELEMENT LINE

EDELE

FOR THE DATA ELEMENT STATED ABOVE SELECT ONE OF THE FOLLOWING MODES OF PRINTOUT 5

(ALL SIGNED MODES WILL HAVE THE SIGN SUPPRESSED IF POSITIVE)

1 UNSIGNED OCTAL INTEGER WITH LEADING ZERO
2 SIGNED DECIMAL INTEGER
3 SIGNED EXPONENTIAL
4 SIGNED FLOATING POINT
5 UNSIGNED DECIMAL INTEGER

IF THE RESPONSE ABOVE IS 3 OR 4 STATE THE NUMBER OF DIGITS TO THE LEFT OF THE DECIMAL POINT:__

0240 FOPN10

DATA ELEMENT LINE

EDELE

FOR THE ELEMENT ABOVE STATE

A THE STARTING PRINT POSITION: _57

WHEN STATING LENGTH OF FIELD FOR DATA ELEMENTS INCLUDE SIGN AND DECIMAL POINT FOR EXPONENTIAL OUTPUT INCLUDE 6 CHARACTERS FOR SIGN, DECIMAL POINT AND EXPONENTIAL FACTORS

B THE LENGTH OF THE PRINT FIELD: __4

0241 FOPN11

DATA ELEMENT/LINE

EDELE

DO YOU WISH TO PRINT THE ABOVE ELEMENT MORE THAN ONCE ON THE LINE? _NO

YES THEN COMPLETE THE FOLLOWING·

PRINT THE ELEMENT __TIMES ON THE LINE WITH __ PRINT SPACES BETWEEN THE STARTING PRINT POSITIONS OF THE REPEATED ELEMENT.

```
0243 FOPN13

LINE

DO YOU WISH TO SPECIFY ANY MORE ELEMENTS FOR THE ABOVE
IMAGE ? _NO
```

0245. FOPN15

OUTPUT SET

DO YOU WISH TO ADD MORE PRINT COMPONENTS TO THE CURRENT
IMAGE STATED ABOVE? _NO

```
0246 FOPN16

DO YOU WISH TO SPECIFY ANY MORE OUTPUT SETS? _NO
```

0203 CONT3 1

DO YOU WISH TO SAVE THIS PROCESSING ELEMENT FOR FUTURE MODIFICATION OR EXECUTION?
(SELECT BY NUMBER)

1 YES, ACCESS THE LIBRARY TO INSERT THIS ELEMENT
2 NO, THIS ELEMENT IS TEMPORARY

0209.CONT9

WHEN ACCESSING THE LIBRARY SELECT OPERAND AND OPERATOR OPERATORS ARE:

1 = SELECT	2 = INSERT	3 = DELETE
4 = PAGE FORWARD	5 = PAGE BACKWARD	6 = UPDATE
7 = ADD A PAGE	8 = EXPLAIN	9 = RESUME

AN OPERAND IS A 1 WORD KEY AND AN OPTIONAL 3 WORD DESCRIPTOR

WALTON1 ISOTOP EXAMPLE1 OPERATOR = 2

(NOTE: THE ABOVE IS FOLLOWED BY A LIST OF APPLICABLE OPERANDS)

0204.CONT4 1

DO YOU WISH TO EXECUTE THIS DATA PROCESSING ELEMENT? (SELECT BY NUMBER)

1 YES, PROCEED WITH DIALOG
2 NO, RETURN TO DIALOG START

0205 CONT5 1

DO YOU WISH TO ESTABLISH AN ELEMENT GROUPING FOR EXECUTION TIME PROCESSING

1 NO
2 YES, ACCESS THE LIBRARY TO SELECT YOUR ELEMENTS
THOSE SELECTED WILL BE PRESENTED BELOW FOR VALIDATION.
3 THE ELEMENTS SELECTED ARE CORRECT
4 THE SELECTION IS INVALID.

SELECTED ELEMENTS ARE:

(NOTE: THE ABOVE IS FOLLOWED BY A LIST OF THE SELECTED ELEMENTS)

0207 CONT7 60

SPECIFY IN SECONDS THE RESPONSE (POLLING) TIME DESIRED FOR THE ON — LINE INITIATIVE KEY-INS WHICH MAY BE USED DURING THE EXECUTION OF THIS PROCESS OR INSERT 2 ZEROS TO ELIMINATE POLLING.

0208 CONT08

YOU ARE NOW PROCESSING YOUR DATA. IF YOU SPECIFIED A TIME TO INTERROGATE ANY INITIATIVES DURING PROCESSING, THE FOLLOWING INITIATIVES WILL BE ACCEPTED:

TRMALL -	TERMINATE ALL PROCESSING WITH A FINAL CALL TO OUTPUT.
TRMONE -	TERMINATE ONE USER PROCESSING A LIST WILL BE PRESENTED FOR SELECTION
DLTALL -	DELETE ALL PROCESSING WITHOUT MAKING FINAL OUTPUT CALL
DLTONE -	DELETE ONE USER PROCESSING A LIST WILL BE PRESENTED FOR SELECTION

WHEN YOU WISH TO INSERT AN INITIATIVE, PUT THE INITIATIVE IN THE SPACE PROVIDED AND DEPRESS SEND BLOCK

A QUERY FOR INITIATIVES WILL BE PERFORMED AT THE TIME INTERVAL PREVIOUSLY SPECIFIED

A 3 SAMPLE PRINTOUT

MONTH	DAY	HOUR	MIN	SEC	D	DELE	EDELE
JULY	1	1	0	.00	32	5	7
JULY	1	1	0	1.05	100	10	14
JULY	1	1	0	2.10	232	15	21
JULY	1	1	0	3.16	512	160	224
JULY	1	1	0	4.21	1056	25	35
JULY	1	1	0	5.26	2208	30	42
JULY	1	1	0	6.31	4448	35	49
JULY	1	1	0	7.36	9184	40	56
JULY	1	1	0	8.42	18400	45	63
JULY	1	1	0	9.47	37856	50	70
JULY	1	1	0	10.52	75744	55	77
JULY	1	1	0	11.57	155616	60	84
JULY	1	1	0	12.62	311264	520	728
JULY	1	1	0	13.68	638944	70	98
JULY	1	1	0	14.73	7	75	105
JULY	1	1	0	15.78	48	80	112
JULY	1	1	0	16.83	128	85	119
JULY	1	1	0	17.88	296	90	126
JULY	1	1	0	18.94	624	95	133
JULY	1	1	0	19.99	1312		
JULY	1	1	0	21.04	2656		
JULY	1	1	0	22.09	5472		
JULY	1	1	0	23.14	10976		
JULY	1	1	0	24.20	22496		
JULY	1	1	0	25.25	46024		
JULY	1	1	0	26.30	92128		
JULY	1	1	0	27.35	184288		
JULY	1	1	0	28.40	376800	140	196
JULY	1	1	0	29.46	753632	145	203
JULY	1	1	0	30.51	15	150	210
JULY	1	1	0	31.56	62	1240	1736
JULY	1	1	0	32.61	160	160	224
JULY	1	1	0	33.66	352	165	231
JULY	1	1	0	34.72	752	170	238
JULY	1	1	0	35.77	1536	175	245
JULY	1	1	0	36.82	3168	180	252
JULY	1	1	0	37.87	6368	185	3
JULY	1	1	0	38.92	13024	190	10
JULY	1	1	0	39.98	26080	195	17
JULY	1	1	0	41.03	53216	1600	192
JULY	1	1	0	42.08	106464	205	31
JULY	1	1	0	43.13	217056	210	38
JULY	1	1	0	44.18	434144	215	45
JULY	1	1	0	45.24	884704	220	52
JULY	1	1	0	46.29	22	225	59
JULY	1	1	0	47.34	78	230	66

APPENDIX B
OGO-F
LAUNCH SUPPORT

APPENDIX B:

OGO-F LAUNCH SUPPORT

The objective of this section is to identify the subset of the planned DRL functional capabilities which it is anticipated will be operational for support of the OGO-F launch

A 1 DATA SELECTION CAPABILITIES

Data selection capabilities for OGO-F data tapes are as follows

A REEL NUMBERS IN ORDER OF PROCESSING

1 Specific Interval over all reels Expressed by User as:

a GMT Day, Hour, Minute, Second plus Interval Length in seconds, or

b Spacecraft Clock in Octal plus reference Spacecraft Clock (Octal) and Correlated GMT (Day, Hour, Minute, Second) plus interval in seconds

2 Process tape reels with no time constraints

B SPECIFIC STATION ONLY

C SPECIFIC EXPERIMENTER BIT NUMBER ONLY

D SPECIFIC DATA MODE (PLAYBACK OR REAL TIME) ONLY

E SPECIFIC TRANSMISSION RATE FOR REAL TIME DATA

F SPECIFIC FRAMES (WHERE NUMBERING IS 1-128)

1 Start at frame M

2 Select every Kth frame

3 Repeat for every subcom sequence, or

4 If $M < 0$ starting at frame $|M|$ select K consecutive frames from each subcom sequence

NOTES:

1 None of the major categories A-F are mutually exclusive (it is possible to select all simultaneously)

2 If B, C, D, or E is used then the file is automatically advanced if the condition(s) is not met

3 All Selection capabilities mentioned herein are handled by the raw input routine

A 2 This section specifies the GORTRAN capabilities which will be operational as part of the OGO-F launch support The method of specification is by identification of the GORTRAN keywords which will be functional

Keywords to be functional for OGO-F launch support:

GROUP

DATA

HOLD

TEST

ELSE

THEN

OUTPUT

FINI

A 3 MISCELLANEOUS

A.3 1 The following features described previously are not yet operational

section 3 3 EXPLAIN and NARRATE

section 5 2 SUSPND and PRINOW

A 3 2 NOTES

Program initiated dialog as described in 5 2 does not exist There are no error recovery procedures, however there are aids to the DRL system programmers to help them determine the cause of the error Please contact one of the Experiment Computation Section in case of an error

DLTALL and DLTONE are now used in place of TRMALL and TRMONE (5 2)

There is a limit of 10 output sets per process definition (6 2 7)

Channel 0 is used during syntax to define time (millisecond of year) TIME as a system label is not implemented (4 2 1).

A 4 CURRENT SYSTEM LABELS

COMPLETE LITERAL	SYSTEM LABEL
DAy of data SToP	TDASTP
DAy of data STarT	TDASTT
EQuipment GRoup in use	TEQGR
EXperimenter STatus indicator	TEXST
FIle NUmber	TFINU
FLex format INdicator	TFLIN
FLex format NUmber	TFLNU
REel NUmber	TRENU
SAtellite IDentification	TSAID
SEcond of data SToP	TSESTP
SEcond of data STarT	TSESTT
STation	TST
TYpe of DAta (rate)	TTYDA
YEar of REcording	TYERE
DAta MOde	UDAMO
DAte of RUn	UDARU
DAta SElection	UDASE
EXperimenter IDentification	UEXID
EXperiment MAsk	UEXMA
EXperiment NUmber	UEXNU
FLex format NUmber	UFLNU
INput FRame selection	UINFR
REference time BAse	UREBA
REel NUmbers	URENU
SAtellite IDentification	USAID
STation	UST
SToP time of DAta	USTPDA
STarT time of DAta	USTTDA
TYpe of DAta (rate)	UTYDA
TYpe of reel PRocessing	UTYPR

GLOSSARY

ALTER MODE: The mode used to "alter" syntax. This mode is entered automatically if errors are found by the DRL system or it may be entered by the user to modify his data processing algorithm

CONSOLE: The devices used to communicate with the computer. A DRL user console consists of a Sander's 720 alphanumeric CRT and an IDIIOM

CRT: Cathode Ray Tube, a device used to display information.

CTMC: Communications Terminal Modulor Controller, UNIVAC equipment (e. g. teletype, Sander 720's) used to interface terminals with the UNIVAC 1108.

DIALOG: The term used for the conversational question—answer mode of user communication.

DRL· Data Reduction Laboratory A workshop for the generation, checkout and modification of processing programs and for the presentation of data processed through these programs

DRLRUN: The name of the file containing the DRL control card images.

EXEC 8: The UNIVAC supplied executive system for the UNIVAC 1108

FASTRAND: A mass storage drum which is part of the UNIVAC 1108 configuration used by DRL.

GORTRAN: Group ORiented TRANslator, the DRL telemetry reduction language.

IDIIOM: Information Displays, Incorporated Input-Output Machine, a graphic CRT display.

PCM: Pulse Code Modulated. Used with reference to telemetry data

SCOPE: Another term used to refer to the Sander's 720 CRT.

SYNTAX: The DRL telemetry reduction user-oriented language (GORTRAN).

TERMINAL: The device located by the user of a computer system for his use in communicating with the computer